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VOLUME 24 JULY, 1918 NUMBER 295

American Forestry

An Illustrated Magazine about Forestry and Kindred Subjects Published Each Month by the American Forestry Association, Washington, D. C.

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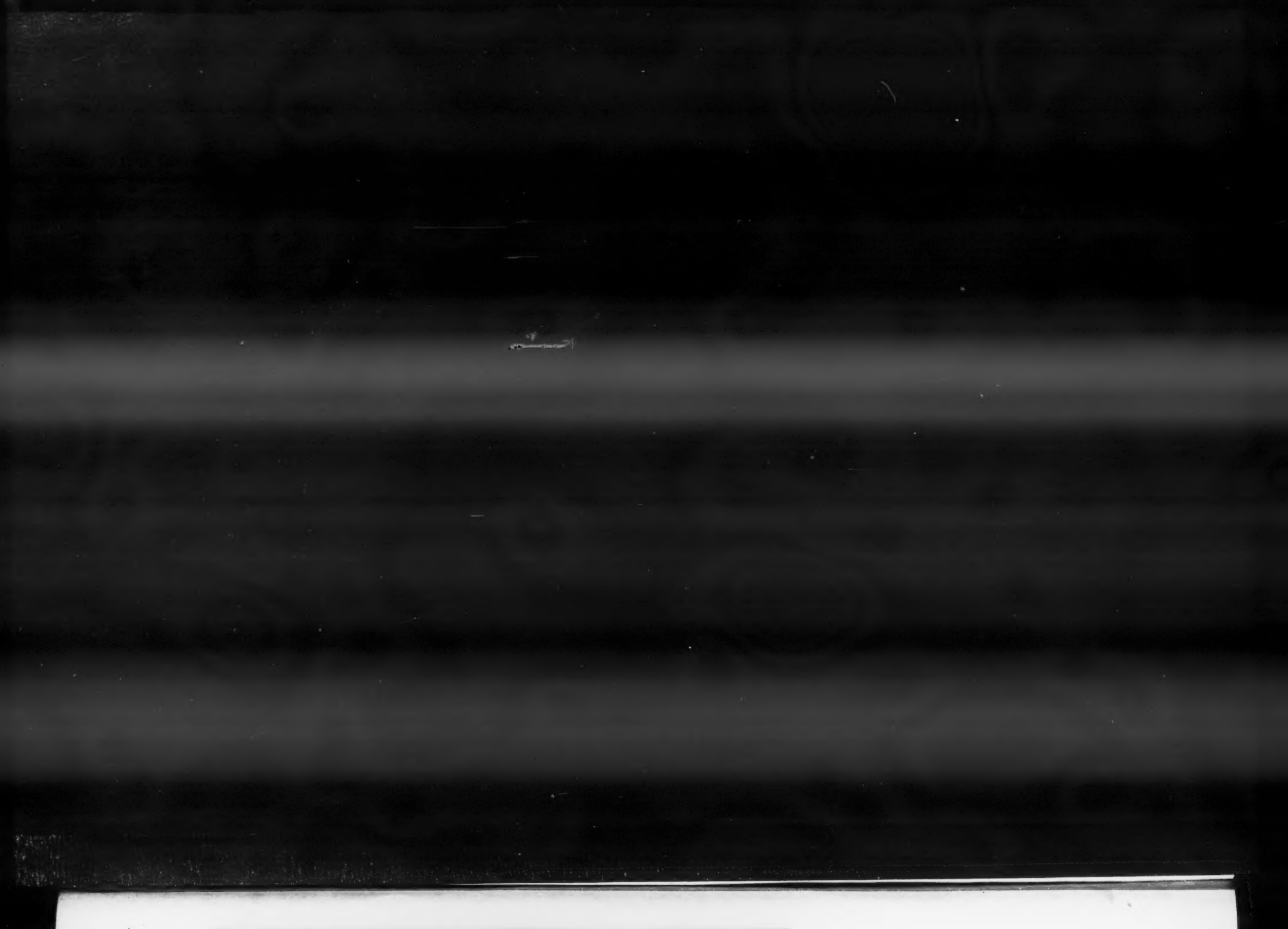

AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

JULY 1918 VOL. 24 CONTENTS No. 295

IN THE BEAUTIFUL SNOQUALMIE FOREST

This shows the quiet beauty of Upper Twin Lake, at the head of Troublesome Creek, in the Snoqualmie National Forest, Washington.

Entered as second-class mail matter December 24, 1909, at the Post-office at Washington, under the Act of March 3, 1879.

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GIVE

FOR THE RELIEF AND COMFORT

OF THE

Lumber and Forest Regiments

IT WAS THEODORE ROOSEVELT WHO SAID—

> WE FIGHT NOT ONLY TO PROTECT OURSELVES BUT TO BRING NEARER THE DAY WHEN JUSTICE AND HONOR AND FAIR DEALING BETWEEN NATION AND NATION, AND MAN AND MAN SHALL EXIST THROUGH ALL THE CONTINENTS. WE LOVE LIFE, BUT THERE ARE THINGS WE LOVE EVEN MORE THAN LIFE, AND WE FEEL THAT WE ARE LOYAL TO ALL THAT IS HIGHEST IN AMERICA'S PAST, WHEN WE ACT ON THE BELIEF THAT THOSE ONLY ARE FIT TO LIVE, WHO ARE NOT AFRAID TO DIE.

CITIZEN SOLDIER No. 238, OF THE NATIONAL DRAFT ARMY, WRITES:

"THEY *say,* who have come back from Over There, that at night the troubled earth between the lines is carpeted with pain. They say that Death rides whistling in every wind, and that the very mists are charged with awful torment. They say that of all things spent and squandered there young human life is held least dear. It is not the pleasantest prospect for those of us who yet can feel upon our lips the pressure of our mothers' goodby kiss. But, please God, our love of life is not so prized as love of right. In this renaissance of our country's valor, we who will edge the wedge of her assault make calm acceptance of its hazards. For us the steel-swept trench, the stiffening cold—weariness, hardship, worse. For you for whom we go, you millions safe at home—what for you? *We shall need food.* We shall need care. We shall need clothes for our bodies and weapons for our hands. We shall need terribly and without failure supplies and equipment in a stream that is constant and never ending. From you who are our resource and reliance, who are the heart and hope of that humanity for which we smite and strive, must come these things."

The American foresters who are doing such valiant work in France deserve the hearty support of their friends back home—the members of the American Forestry Association and all others interested in the subject of forestry.

To these men, the members of the Forest Regiments, has been assigned the important task of supplying for the American army and the fighting forces of the Allies the timber needed for a thousand uses in construction work. *BACK UP OUR FIGHTING FORESTERS!*

FILL OUT AND SEND THIS FORM WITH YOUR CONTRIBUTION

Donation To The Welfare Fund For Lumbermen And Foresters In War Service

I enclose check for $_____ a donation to be used for the comfort and relief of the men of the Tenth and Twentieth Engineers (Forest) Regiments.

Name_____

Address_____

A list of the donors will be acknowledged in the AMERICAN FORESTRY magazine each month.

AMERICAN FORESTRY

VOL. XXIV JULY, 1918 NO. 295

WITH THE AMERICAN LUMBERJACKS IN FRANCE

BY W. B. GREELEY, LIEUT.-COL., ENGINEERS, N. A.

IF LUMBER will win the war, the Kaiser may as well call it "quits." The American lumberjacks are on the job in France, barring the 95 men who went down on the *Tuscania*. Their April drive netted 14,800,000 feet of lumber, 153,000 standard railroad ties, 103,000 ties for light railroads, and 316,000 pieces of piles, poles, and small round products; and we have hardly gotten started. Already the shipping office, which has the hardest car-supply job a lumberman ever tackled, is working nights to keep the loading ground clear.

As a business concern, we have an organization which might draw the envy of a Minnesota Line Yard Company. The Colonel of the — Engineers is at the head of it with the Colonel of the — as Assistant General Manager. Both of these officers are shouldering other large responsibilities aside from the work of the Forestry Section. Then come the Department heads, three Majors in charge of Operation and Equipment, Products and Shipment, and Timber Acquisition respectively. Upon the first falls the approval of operation plans, the allotment of saw mills and transport equipment, action upon requisitions for all sorts of technical equipment and supplies, and field inspection of the efficiency of the operations. About sixty per cent of the time of this Major, who heads the 4th Battalion, — Engineers, is spent in signing requisitions or telling the District Commanders that something they want cannot be had and must be done without. The regimental engineer officers are members of his staff, working in and out of Headquarters and a busier spot would be hard to find.

A second Major from the — handles the specifications of the products which are cut, works over the requisitions which pour in upon us from every branch of the army, and places the orders with the various operations. This office also has the difficult task of rustling cars and keeping our shipments moving to the front and to the various base ports and depots of the American Army.

The Timber Acquisition Department is as far flung as the borders of France herself. In every Operating District, one or more officers are looking up new logging chances. We have timber scouts in the Pyrenees, in the lower French Alps, and in the rough Central Plateau of France where mountain timber and mountain logging are the rule. Three officers represent the Forestry Section in the *Comite Interalliee du Bois de Guerre* which sits in high state and passes upon stumpage purchases or requisitions for all of the allied armies, while a fourth handles our interests with the French *Direction d'Etapes*

EVERY YANK ON THE SAW MEANS ONE LESS BOCHE — THIS IS WHY THEY SMILE!

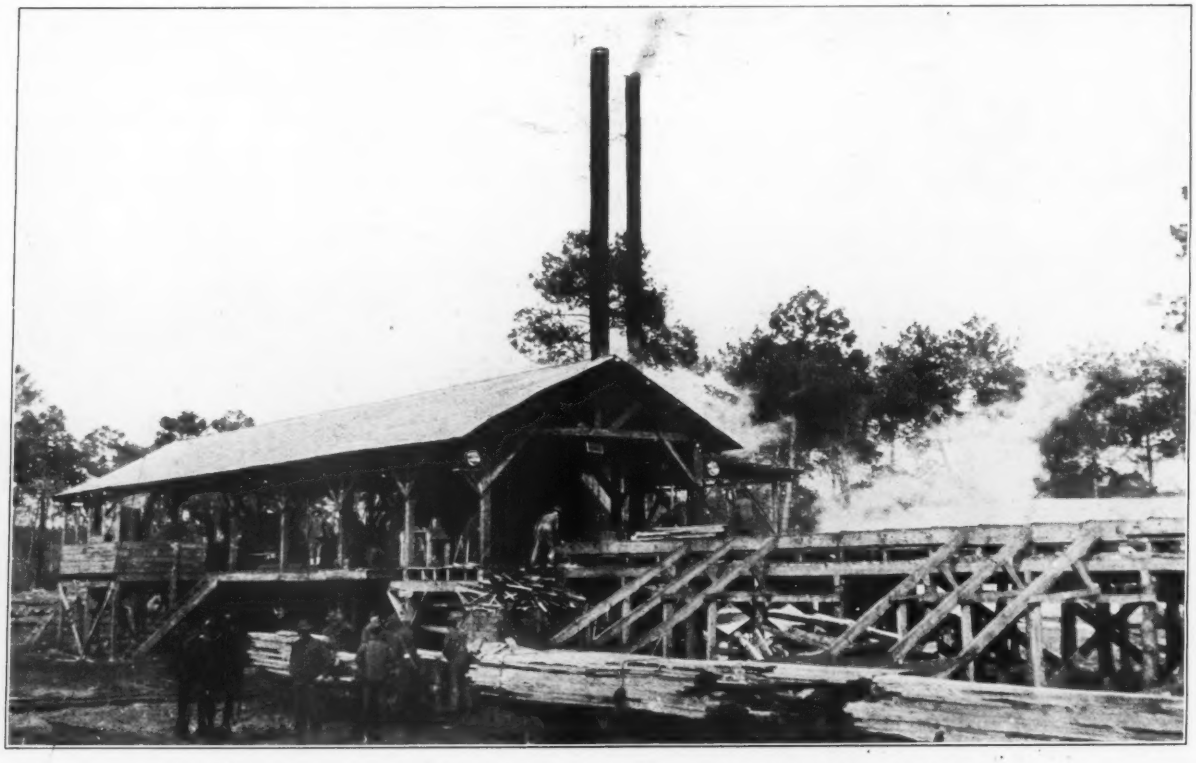
A LOG ON ITS WAY TO THE MILL

A LULL IN THE DAY'S OCCUPATION

FRENCH BIG WHEELS ON AN AMERICAN LOGGING JOB

FORESTRY TROOPS OF THE AMERICAN EXPEDITIONARY FORCE—USING ONE OF THE TRICKS THEY KNOW

With timber scouts in the Pyrenees, in the lower French Alps and in the rough mountain section of the Central Plateau, logging by the American troops goes merrily on in France, and they find use for every trick they learned in the good old U. S. A.



THIS IS ONE OF THE 20,000-FOOT DAILY CAPACITY AMERICAN MILLS IN FRANCE

Working under tremendous pressure, running day and night, the machinery and men of the Forestry Troops have been severely tested, and have given a splendid account of themselves, with the generous assistance of the French.

which controls forest cessions in the advanced zone. The Timber Acquisition department is responsible for keeping a supply of forests ahead of our saw mills, and at the rate at which our mills and pole crews and tie hacks are eating up the stumpage, there is a hefty job cut out for it.

Aside from these technical departments, our Central Office includes the headquarters of the two forestry regiments with their adjutants and the regimental supply officers who have their hands full in keeping the camps stocked with quartermasters supplies, forage, gasoline and oil, and the like. The forestry operations in France are grouped in districts, each of which conforms roughly to a battalion in troop strength and comprises from three to six saw mills. Our districts now extend well over eastern, central, and southern France. One group of them covers the eastern mountain ranges, from the Vosges down to the edges of the French Alps. These are truly wonderful softwood forests, many of whose dense stands evoke the admiration of even our Pacific Coast lumbermen. This timber is largely silver fir, which is the white pine of France; and the mountain belt forms our best supply of general construction lumber. The region is much like the Adirondacks or White Mountains, though with larger timber, and presents similar logging conditions. Two old-time Pacific Coast loggers are working out the most difficult chance we have with a 2200 foot hoist, which would not be sneezed at even in the Cascades. Sled hauling was possible during a part of last winter and gave our men from Minnesota and Northern New England a chance to show their prowess in this kind of logging.

LIEUT.-COL. W. B. GREELEY, N. A.

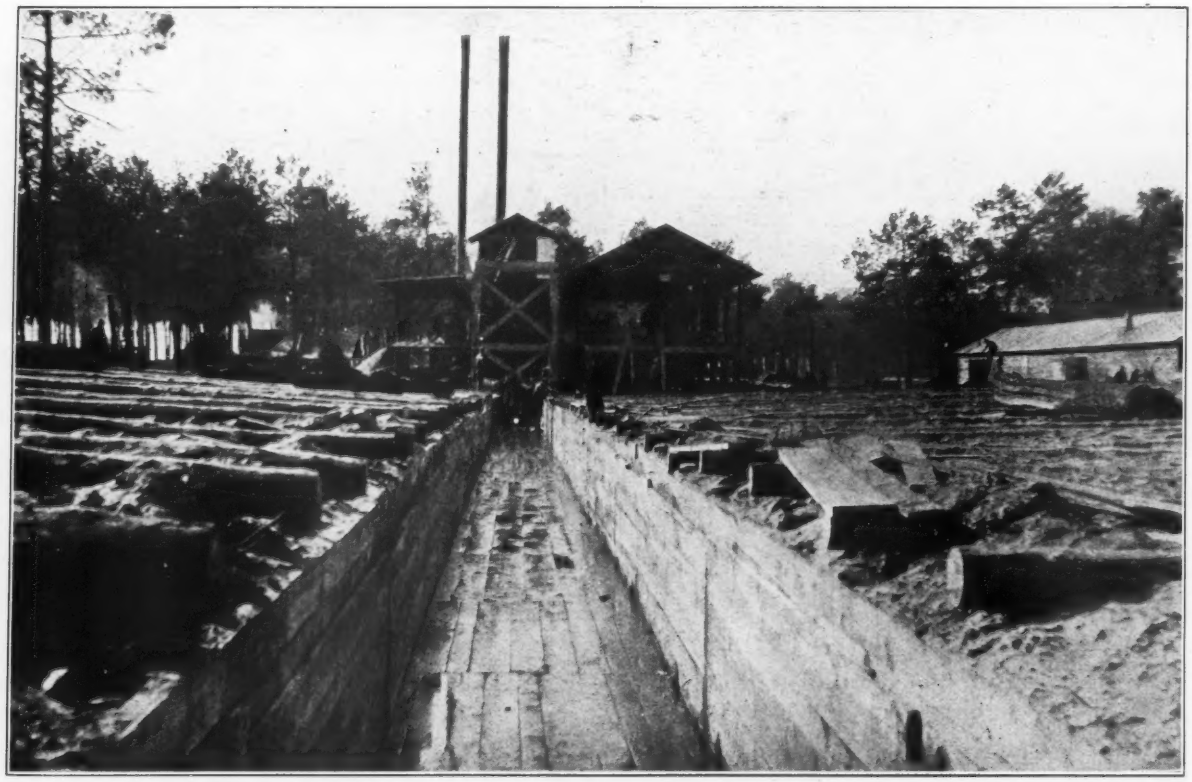
Recently assigned to a high staff position, Colonel Greeley is attached to the Forestry Section of the Corps of Engineers, American Expeditionary Forces.

Another group of Districts stretches over the rolling hills and plateaus of Central France, which offer a wide variety of forests and forest products. The most common timber is oak, usually growing over a thick understory of hardwood sprouts, the principal source of French fuelwood. The initiation of many of our Northwest lumberjacks was in cutting three or four inch sprouts and even in cutting fine brush and binding fagots. Much of the oak is well suited for railroad ties and this region will be one of the principal sources of the monthly supply of hundreds of thousands of ties which the Railroad and Dock Section requires at the ports and depots of the Expeditionary Forces and for enlarging the capacity of the railroad lines used in forwarding troops and supplies to the front. While waiting for their saw mills, many of our men have been hewing ties with every sort of tool from a French ax, cast along medieval lines, to a genuine American broad ax. Occasional stands of oak are large enough for bridge and dock timbers, and every log suited to that use must be carefully reserved. The Central French districts also contain many Scotch pine forests, planted for the most part, and from several of these we are getting excellent construction lumber, some large timbers, and even a considerable quantity of piling. The areas of small Scotch pine furnish our main supply of telephone and telegraph poles, corduroy, and wire entanglement stakes. Here is located our principal "pole factory" which broke all records when the sudden call came last winter for 200,000 wire entanglement stakes "tout de suite."

Central France is a region of woodlots. We are developing flying squadrons of small detatchments, lightly equipped with bolter mills and motor trucks, to work out the little bunches of tie or pole timber which are almost unlimited. These are the patrols or snipers of the forestry army, and they must be employed more and more largely as time goes on.

A third group of Districts takes in the sandy pineries of southern France where the longleaf lumberman feels at home. The extent and value of the forest resources of this region and the way they have been built up by human thrift and patience have given every one of us a lesson in conservation which will never be forgotten. The

forests are of pure maritime pine, which is probably nearly equal to longleaf as a resin producer and fully as good as shortleaf in structural qualities. The timber is usually cut at 55 or 60 years after active resin production ceases. It runs mostly to a good tie size or a little larger, with occasional patches of real saw timber. The southern French pineries are one of our large sources of railroad ties; and the American mills established there are also furnishing a good cut of lumber and timber for the base docks and shortage depots. It is a flat sandy country, rolling up into dunes near the coast. The American big wheels are very much at home there; also the light railroad, which can easily be picked up and relaid. We have scoured France for everything resembling light railroad equipment, from 60 centimeter track with little cars that look like a Christmas toy up to meter gauge roads running anything that had four wheels on it. There is a motley collection in the American logging camps, man trains, horse trains, and real locomotive trains, but they are getting out the logs. Now that our own standardized rail equipment is arriving, the railroad logging is looking up.



ANOTHER VIEW OF ONE OF THE BIG AMERICAN SAWMILLS NOW OPERATING IN FRANCE

This is the mill of C Company, 10th Engineers (Forest), showing flume and log decks. The mills are running at a good clip, the cut of the five larger mills in April alone totaling 6,805,000 board feet.

The American saw mills are giving a good account of themselves in France. We have worked under tremendous pressure, and machinery as well as men have been severely tested. Keen rivalry between the different companies has put added punch into the game. The A and B Company mills of the — Engineers, two of the first to begin running, were both rated at 10,000 board feet in 10 hours. Once shaken down to their work, both were clipping off from 20,000 to 25,000 feet of lumber in two nine hour shifts, the Central Office egging them on with frequent reports of the good work the other crew was doing. Then A Company put on three seven hour shifts and passed 29,000 feet. B Company came back with a run of 35,600 feet of lumber and 1200 feet of ties in two nine hour shifts, although we suspect an overly careful selection of logs. Monthly figures, of course, tell the real story. One of the 10,000 foot mills of E Company, — Engineers, turned out 448,000 board feet in March and 565,000 feet in April. A second small mill operated by another detachment of this company, with the help of a little French water power plant rated at one and one-half thousand feet, cut 647,000 feet of lumber in March and 723,000 feet in April. The 10,000 foot mill of B Company, — Engineers, produced 1,275,000 feet of lumber in the two months. Another mill of the same type operated by B Company, first Battalion, — Engineers, manufactured 525,000 board feet in March and 700,000 board feet in April.

Our larger mills, rated at 20 thousand feet in ten hours, clung to the Atlantic shore for many months, either waiting to join the triumphal entry into Berlin or following the principle that heavy artillery should keep well in the rear. Finally they began to arrive in skirmish formation, first a fly wheel, then a couple of edger saws, then a car-

riage, with the boiler always as rearguard. Meanwhile we grew gray and desperate and worked our hearts out on pitiful little French mills where the logs are fed to the saw by man-power applied to a crank or by the bare hands. At last, however, we have the five 20 thousand foot mills of the — Engineers up and running at a good clip. Their April cut was 6,805,000 board feet, mostly of thin lumber. D Company's mill, which includes a bolter saw and a little French portable rig, led the race with a cut for the month of 1,923,242 feet. F Company's mill came second with 1,525,282 feet. The mill equipment of the — Engineers is coming along somewhat faster, and we were generously helped by the Canadian Forestry Corps with three large and two small mills. At the present writing, we are operating seven 20's and ten 10's, while eight mills of each capacity are being installed. We are also working nine French mills besides a number of American bolter mills and small French portable rigs.

One must see the enormous scope of the construction work as well as of the military activities of the American Army in France to appreciate its needs for forest products and the exceedingly important part they must play in winning the war. The demands upon our section, in quantities and variety, pass the comprehension of the old-time military campaigner. They range from 100 foot piles to fascines of six foot twigs, from bills of dock and bridge timbers totaling five million feet to basswood cants for the manufacture of artificial limbs by the Red Cross. Construction lumber for barracks and warehouses, standard gauge ties, and cordwood are the great staples, of which we cannot produce too much. Then come the heavy plank for artillery roads, telephone and telegraph poles, short ties for light railroads, and

A FORESTRY CAMP IN FRANCE

Who can make a better camp than a lumber-jack soldier? This is a typical street in one of the camps. The conditions of the soldiers are nearly perfect, as the men are either housed or quartered in such tents as these, floored and walled with lumber affording ample protection.

THE "CAPTAIN," WITH A LOAD OF LUMBER, STOPS TO LET US TAKE A PICTURE

Bringing out the lumber for the construction of barracks and ware-houses, ties and cordwood, and the special effort to rush supplies for construction to the American base ports is a strenuous business, but our American boys are making good.

corduroy and wire entanglement stakes by the hundreds of thousands of pieces. We have recently undertaken the manufacture of a large order of excelsior for the bedding of soldiers at the front, and must add probably two excelsior mills to our plant equipment. Our hardest immediate problem is to supply dock materials—piles, stringers, and caps, for the enormous additional dockage under rush construction at the American base ports. It is a strenuous game, where life-long training in business efficiency and economy must be subordinated to the one goal of *speed*. But the American lumberjacks are right on the job.

WAR LUMBERING IN FRANCE

A DIRECT ACCOUNT OF THE WORK OF THE 20TH ENGINEERS (FOREST)

BY LIEUT. R. H. FAULKNER

EDITOR'S NOTE—The following aritcle by Lieut. Faulkner, with the accompanying photographs, will be of unusual interest to foresters and lumbermen as indicating the output and character of the lumbering work done by the men of the lumber regiments under war conditions. It also indicates that the men are in good health and well cared for, a large part of which is due to the timely assistance rendered by the Welfare Fund Committee for Lumbermen and Forestry Soldiers.

THE larger and earlier fortunes made by lumbermen in America were due chiefly to the acquirement of vast areas of stumpage at a price so ridiculously low that conservation was a thing to be scoffed at, while today the ever increasing price of stumpage makes necessary the most careful and conservative management.

Could any operator today in the United States of America make a tour of the lumbering operations of the Forestry Regiments, 10th and 20th Engineers, in France, they would see economical operations carried out to the minutest detail. And this is not fanatical conservation, it is not conservation that adds excessively to the cost of production but it is due to an entirely new spirit of lumbering, the spirit of the American forestry troops, which taboos absolutely the waste of any material which can be of use. And when this is said, in France, it means the utilization of every part of the tree, down to branches only one and one-half inches in diameter.

The American forestry troops are divided into ten districts scattered practically through all timber areas of France and this, by the way, is approximately one-tenth of the total area of the country. These ten districts are divided into about forty operations ranging in size from small pole, piling and tie cutting to the operations of 20 thousand capacity mills, running night and day shifts.

There is a great variety in the species of timber over here, with the consequent variety in operating conditions. There is everything from a spruce forest, with

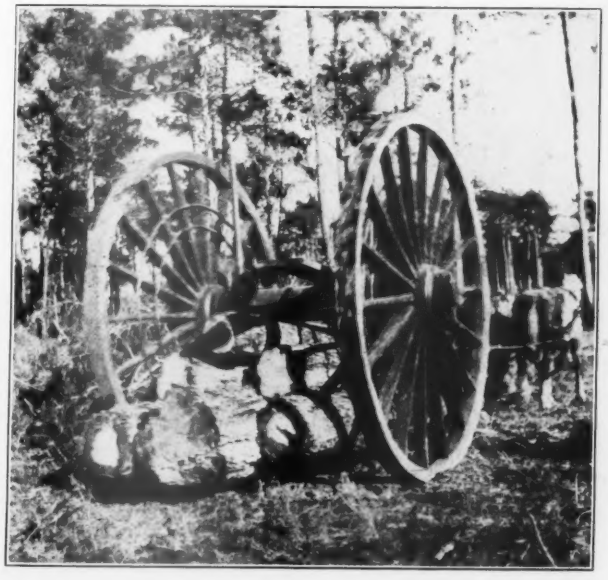
ONE OF THE AMERICAN LOGGING OPERATIONS IN FRANCE

Notice the method of handling the logs, and their size. This is one of the saw mills operated by the Forestry Troops of the American Expeditionary Force, where we find a wonderful example of economical utilization down to the smallest detail.

logging conditions quite similar to those in the Adirondack Mountains—to the maritime forests, almost identical to the pine found in southern Georgia.

The maritime pine forests in France cover approximately 2,500,000 acres and contain about 130,000,000 trees. The stand varies from approximately 6,000 to 15,000 feet, board measure, per acre. While there are some very large blocks of solid timber it is against the custom of the country to allow the cutting of great single areas, particularly for the reason that the peasantry in the maritime pine section are practically dependent upon the resin industry. Consequently, while there is quite a bit of timber available for American exploitation, it is meted out, as a general rule, in small *parcelles,* necessitating the installation of portable ground mills. The American forestry troops in the pine country here, are cutting, besides lumber, a great quantity of round timbers, ties, trench props and wire entanglement stakes. There is absolutely no waste, for all slabs and limbs are cut into fuel wood.

There was a popular idea expressed by lumbermen in America before the departure of the first forestry battalions, that the cost to the Government to produce lumber with the engineer troops in France would be tremendous. Several wiseacres went so far as to predict the approximate cost and the writer heard a very well-known



A FAMILIAR SIGHT IN A STRANGE LAND

In use on an operation of the 20th, these "big wheels" look like they might be busy in the piney woods of our own Southland instead of in sunny France.

American lumberman say, last summer, that it would cost the Government $200 to $300 per thousand to produce lumber in France. As a matter of cold hard fact it is a well-established point here now, that the forestry units of the United States Government are a remarkably good investment. The primary purpose of rapid production to meet immediate needs in the most economical manner by sending the men to France has been much more than satisfactorily realized. When the war is over, there will be returned to the lumber industry of America approximately 20,000 men who are, through their training and experience over here, the last word in logging and lumbering efficiency.

Committee on Public Information

AN AMERICAN OFFICER BEFORE HIS DUGOUT

This village in France was under fire at the time the picture was taken.

The condition of the troops are nearly perfect, everything that could be desired. The men are either housed or are quartered in tents floored and walled with lumber. They are well-equipped with proper clothing and effects. Each camp has shower baths. The large size appetite that accumulates in a lumber camp is very satisfactorily treated three times a day with good, substantial, clean and well cooked food.

Then there is the Y. M. C. A. with the attendant convenience and comforts afforded by this institution to counteract the "blues"—the canteen for tobacco and sweets; books, magazines, free stationery, etc. There is always great interest in the athletic contests conducted by the "Y," in baseball, track, tennis, etc.

Besides the music by the various battalion and regimental bands, numerous vocal and instrumental musicians, American, French, English and Italian, some of whom have attained opera fame, appear at regular in-

tervals to share their splendid gifts with "the boys."

Between times, in the different companies, impromptu quartettes chant American favorites, accompanied, perhaps, by a mongrel stringed orchestra. The "local talent" is varied and is always an interesting and important part of any camp.

The men that make up the forestry troops are a strong and hearty type and their patriotism and their attitude toward one another and toward their organization is most admirable. Just to relate a single instance—twenty-five men of one of the companies went out one evening without orders and on their own free initiative cut one hundred and twenty-five ties. One man can cut twenty-five ties in a day here. The lumberjack, though he represents a non-combatant branch of our great army, has done and is doing his full "bit." His relative importance to our success in this tremendous conflict is real and each man in the United States forestry troops can rightfully feel proud and happy to hold a place in this branch of the service.

THE FORESTRY TROOPS IN FRANCE

BY FRANCIS KIEFER, CAPTAIN, ENGINEERS, U. S. R.

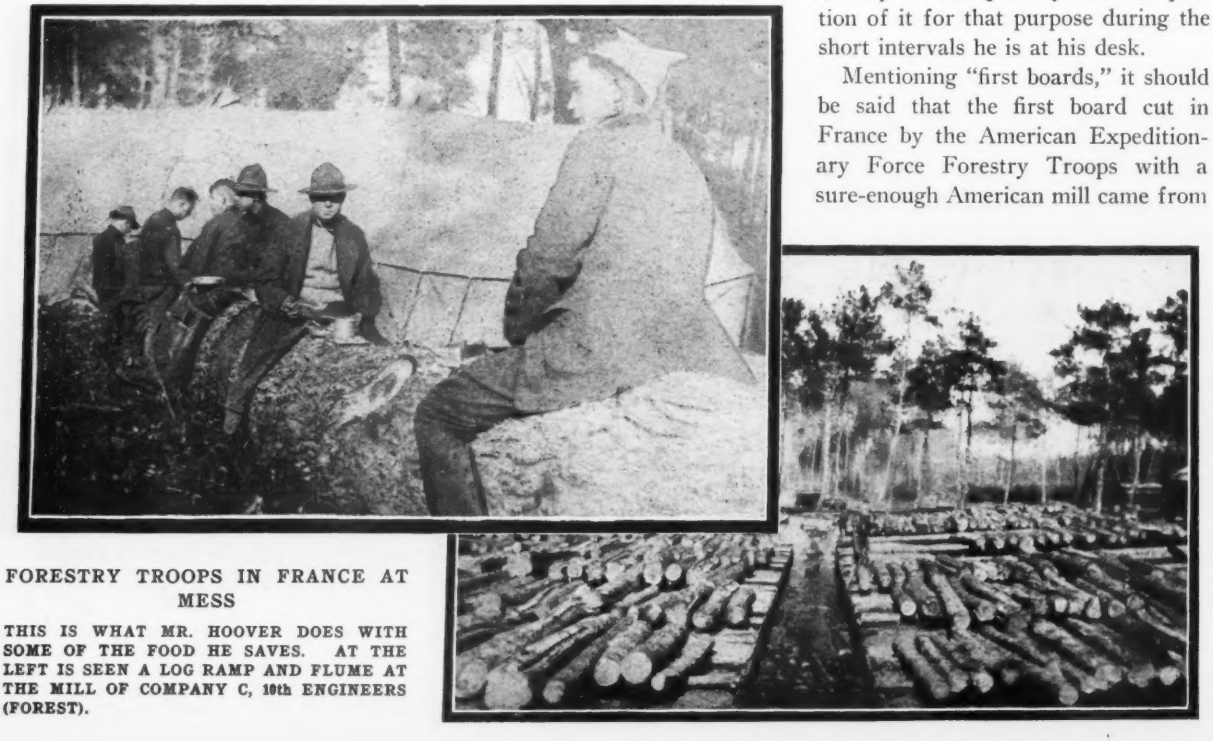
WHAT the American Forestry Troops are doing in France is told in a measure by the production report of April 30, which shows the following totals:

Lumber	26,176,000	feet b.m.
Piling	5,214	pieces
Fuelwood	14,360	cords
Standard Gauge ties	257,186	pieces
Small ties	196,368	pieces
Miscellaneous round products	1,099,368	pieces

These figures may mean little or much depending upon your view point. By that, I have in mind the conditions under which the material making these figures was produced. Forest exploitation as generally conceived in the States is a pioneer undertaking of the first order, accomplished in wild regions removed from the centers of population, wherein pure sweat and brawn count more for the success of the enterprise than any other factor. This in a large degree is true and the training our men of the woods have had in that respect is one of the reasons why they are able to boast of this accounting.

As a sample of that, because it comes handy, I mention the performance of the 20th Regiment Engineers. Upon their landing in France, they started in as though the success of the Allies depended entirely upon them. Exactly eleven days after the —th landed, they were actually stacking ties on the railroad right-of-way in well established fashion just as though they had been logging there a year instead of only eleven days. They had mighty little equipment then and carried the ties out by hand. Moreover, thirty-five days after breaking camp at American University and precisely eighty days after the —th was formally authorized, this outfit sawed their first board in France. However, it wasn't a board; it happened to be a 2" x 4" which may be a mere matter of chance, but there is some doubt about that feature of it. The Major is rather suspected of having it purposely cut to that dimension for convenient paper weight size. At any rate he proudly uses his portion of it for that purpose during the short intervals he is at his desk.

Mentioning "first boards," it should be said that the first board cut in France by the American Expeditionary Force Forestry Troops with a sure-enough American mill came from



FORESTRY TROOPS IN FRANCE AT MESS

THIS IS WHAT MR. HOOVER DOES WITH SOME OF THE FOOD HE SAVES. AT THE LEFT IS SEEN A LOG RAMP AND FLUME AT THE MILL OF COMPANY C, 10th ENGINEERS (FOREST).

—— detachment, Company E, — Engineers. Major ——, on the other hand, claims the distinction for the 2nd Battalion, — Engineers, of having sawed the first board with the all mighty twenty thousand-foot daily capacity mill. But that is a touchy point, better left unsaid perhaps, because there isn't a man in the organization that does not possess splinters from the first board and they all come from different mills and different units! It is not my purpose to start a controversy on who sawed the first board, but simply to show the spirit of friendly though lively competition that exists, which illustrates the force that the men are putting into their work. Nevertheless, I have started a controversy: Captain —— insists upon the insertion here of a corrected statement to the effect that the honors go to Major ——, of the 1st of the 10th Engineers, regarding the "first" board from the twenty thousand-foot mill. Here it is. It's inserted. At the peril of my life, I have opened the discussion that never will be settled as long as there are Forestry Troops alive to talk about it.

SCENE AT ONE OF THE LUMBER CAMPS

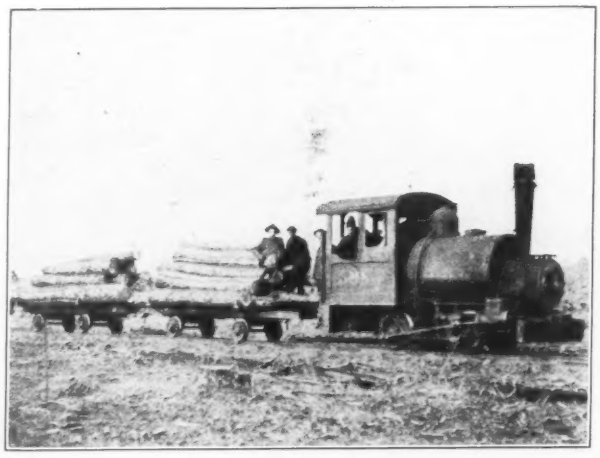
The housing is very substantial, and each camp has its own shower bath. The men that make up the forestry troops are a splendid type and they are kept comfortable and well cared for. Their patriotism and their attitude toward each other and their organization is most admirable.

While sweat and brawn enter into this sort of action, impelled by inspired determination to drive the Kaiser into the last ditch, it also involves a degree of ingenuity, as in the instance of improvising harness with any sort of material that may be at hand. One of the Forestry units, it doesn't matter which one, its merely a sample of what they all have done in one way or another, failed to be supplied with harness promptly. Undaunted, the boys set to making breast straps of grain sacks, tugs and reins of rope, and bits for the makeshift bridles were made from 60D nails. In ordinary times one might have waited for the neces-

TYPICAL ACTIVITIES AT ONE OF THE LOGGING OPERATIONS IN FRANCE

Except for the tents, this scene might be found at many small lumber operations in the States, but it is really a camp of one of the lumber regiments in France where our American boys are working strenuously to produce the wood so badly needed by the allied armies.

sary supplies to come along. But that isn't the present spirit of these lads. Production is what they are working for and production to them means nothing unless presented in the concrete form of ties, lumber, road plank, trench props, cord-wood, fagots, piling, poles, or wire entanglement stakes. With reference to entanglement stakes, one recalls with serious amusement the "Rush" order that came over the wire from "Up Front" one day for an unlimited number of entanglement stakes. They were needed in a hurry! Our boys started in to thrash the Kaiser with entanglement stakes. They tackled the job with mighty little equipment; wagons, horses and motor vehicles were lacking; but no matter, a standing order was issued that no man should return to "Mess" from the woods without all the entanglement stakes he could pack on his back. So in less time than it takes to say it, stakes were pouring out of the woods on the backs of men in an endless ant-like stream; stakes were moving forward from every quarter. That the job had been well done in short order is told by the wire that came back, "Stop sending stakes, can't use any more."



A FRENCH "DINKEY" IS ENLISTED

Always generous in their assistance, the French, in a time of need, lend the American boys an engine to bring in a big load of logs.

Major ——, who has a group of operations made up of detachments from the 10th and 20th Regiments and the 503rd and 507th Service Battalions, received a dispatch at another time to furnish poles, as many as he could as soon as possible. This again was before the rest of the American Expeditionary Forces knew what we really could do. After about two days of a deluge of poles, just when the Major had things organized in his own inimitable way to win the war with poles, a dispatch flashed in, "Flooded with poles, cancel further shipments."

No end of such tales can be told and one leads to another. Along about the same time, the wire brought in an order for 10,000 ties with which to construct a railroad spur at a hospital that was being put up in a rush. In six days those ties were made without a broad ax in the outfit, ordinary single and double bitted chopping axes did the business.

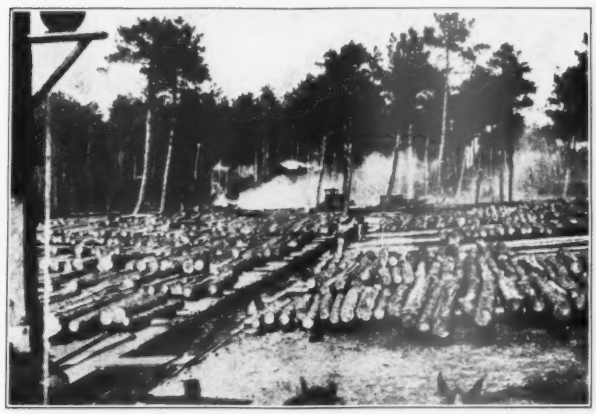
It is a paradox of pioneering in an old and densely settled region, using the equipment our ships are able to bring us across three thousand miles of sea, and accepting in the meantime the generous assistance of the French.

Underwood and Underwood—New Zealand Official Photograph

UTILIZATION IS THE WATCHWORD OF THE LUMBER AND FORESTRY ARMY

And here we see timber which has been salved from German dug-outs and cut up in the saw-mills of the New Zealand Tunneling Company to be used in the construction of dug-outs for our troops.

This is the view point from which we regard those production figures over here, which is shared at least by those in the States who selected and are giving their tireless and skillful attention to sending the Forestry Troops their supplies. "When you get over there, you'll be a long way from home and mother, boys." When he said that, Major Long showed that he had a good conception of the forestry task in France.



JUST AT TWILIGHT

This shows the skidways at one of the 20,000-foot American mills in France, 1st Battalion, 10th Engineers. Ready for the night run.

So a total of 26,000,000 feet of lumber to April 30 is a figure the troops are justly proud of as far as they have gone; they are now getting nicely into their stride. There is no telling what they will do when all of the mills get under way. The monthly outputs have been increasing constantly by leaps and bounds; in March the reports showed 6,965,000 feet; in April 14,578,000 feet. The forecast for May is 15,000,000 feet. It is just to be plainly seen now that with the full complement of equipment rapidly coming into play, with the sawmills buzzing day and night, Uncle Sam soon will be able to rout the Germans with the lumber he is putting out.

DONATIONS TO THE WELFARE FUND FOR LUMBERMEN AND FORESTERS IN WAR SERVICE

AMERICAN FORESTRY will publish each month the list of those making donations to this fund. Many of the donations from members of the American Forestry Association so far received were made without solicitation and were inspired by reading in the magazine that a relief and comfort fund for men of the forest regiments was being collected. Many substantial contributions are being received from the Forest Service and from lumber companies and lumbermen following requests sent to them by the Secretary of the Welfare Fund for Lumbermen and Foresters in War Service, by the lumber organizations of which they are members, and by the committees of lumbermen which had charge in various sections of the United States of securing enlistments for the forest regiments.

Contributions to the Welfare Fund to June 20, 1918, are as follows:

Previously acknowledged	$19,497.06	Nelson, John M., Jr.	5.00
Carpender, Mrs. Charles J.	4.00	Henry B. Newhall, Jr.	10.00
Eckert, Harry K.	3.00	Soble, John J.	2.00
Geisler, Max	5.00		
Gunnison National Forest	18.00	Total	$19,544.06

WORK OF THE WELFARE FUND COMMENDED

LIEUT.-COL. W. B. Greeley, attached to the Forestry Section of the Engineer Corps, and in direct touch with the boys of the lumber and forest regiments now at work in France, writes as follows to the Committee having in charge the Fund for the Welfare of Lumbermen and Foresters in War Service:

"I want to tell you also of my very deep personal appreciation of the admirable work done by the foresters and lumbermen of the country through the 'Welfare Fund' and to express my thanks to yourself and your associates. Thanks to your efforts, our troops are being splendidly supplied with recreational facilities and personal comforts; and I can assure you that they are mighty welcome to our men. The average soldier suffers more from lonesomeness than anything else. The arrival of a mail train brings us all a thrill of expectancy like that of children called to a Christmas tree. It means a great deal to men under these conditions to know that old friends and new friends at home are remembering them, wholly aside from the comfort and recreations made possible by your generous gifts. I hope and intend that you will hear from me more frequently in the future. I am reading the numbers of American Forestry with more than the old-time appreciation and enjoyment. It is certainly holding up to its possibilities splendidly."

A NEW USE FOR DOUGLAS FIR

YET another use has been discovered for Douglas fir—the principal forest product of West Oregon and Western Washington. The United States Steamboat Inspection service at Washington, D. C., is preparing to make elaborate tests of Douglas fir with a view to its extensive use for the manufacture of oars for naval, emergency fleet and merchant marine use.

This only goes to prove once more that Douglas fir is one of America's most useful woods. The possibility of Douglas fir oars was called to the attention of the Government last fall by the New York Boat Building Company, which previously had been in correspondence with the West Coast Lumbermen's Association on this subject and had made up a number of fir oars which proved to be highly satisfactory.

ENGLAND'S FUTURE FORESTS

SINCE the outbreak of war, the need for conserving and augmenting the supply of home-grown timber in England has been amply demonstrated, and the possibilities in this direction are fully explored in the report which has just been presented by the Forestry Sub-committee of the Reconstruction Committee, says the London *Daily Telegraph* of January 9. They strongly urge the adoption of a State afforestation policy, both as a measure of war precaution and as a means towards national improvement and social benefit, pointing out that the case for such a policy, on these as well as on financial grounds, is well-nigh unanswerable.

A scheme of State planting is therefore recommended which in an emergency would keep the United Kingdom independent of imported timber for three years on a present-day war basis of consumption. The total cost for the first ten years would be about £3,500,000, allowing not only for the direct cost of afforestation, but for all incidental charges for administration, education, and research. It is estimated that there are not less than three and probably more than five million of acres of land utilized for rough grazing, but capable of growing first-class timber of the same character as that imported. Of this area 2,000,000 acres could be put under timber without decreasing the home production of meat by more than 0.7 per cent, and it would ultimately give employment to at least ten times the number of men now employed by grazing.

Below are the principal points of the scheme recommended by the sub-committee:

It is proposed to afforest 1,770,000 acres. Taking eighty years as the average rotation, two-thirds of the whole should be planted in the first forty years.

From the fifteenth year onwards the scheme would begin to provide pitwood from the quicker growing species on the better kinds of mountain land.

By the fortieth year the plantations made in the first ten years alone would contain enough timber to keep our pits supplied in emergency for two years at the present rate of consumption.

The total cost for the first forty years may be £15,000,000. After that time the scheme should be self-supporting.

The whole sum involved is therefore less than half the direct loss (£37,000,000) incurred during the years 1915 and 1916 through dependence on imported timber.

A Forestry Commission (represented in the House of Commons) would have charge of the work, and there would be Consultative Committees for England, Wales, Scotland, and Ireland.

It is estimated that the scheme would result ultimately in the settlement on the land of not less than 25,000 families, or 125,000 persons in all.

More important from a war point of view than the enormously enhanced cost of imported timber in 1915 and 1916 was the amount of tonnage absorbed by these imports, which the report states at 7,000,000 net tons of shipping, equivalent to approximately 14,000,000 tons dead weight.

It is pointed out that should the Government wish to employ the maximum number of men discharged from the services during the period of demobilization, the rate of planting might be greatly speeded up. The sub-committee propose that at least 150,000 acres of the initial 250,000 should be planted by direct State action, and that for the remainder (left to local bodies and private landowners) there should be State assistance and control.

It is suggested that the Forestry Commission should consist of six members, three of them whole-time salaried officials, the others unpaid. For carrying out the scheme forest officers, foresters, and foremen would be required, and would have to be trained. It is recommended that the Commission should undertake the general control of forestry education, and should maintain "demonstration woods" for practical work.

Touching on the present position of our home resources, the sub-committee states: "The war has disclosed no demand which could not have been satisfied by timber grown in this country with its favorable soil and climate and abundance of waste land. It is only a question of time before the whole of the country's growing timber which is fit for commercial use must disappear. The result is a depletion which the Government cannot afford to neglect. This country, poorer in timber at the beginning of the war than any other European country except Portugal, will be more destitute still at its close. Even if every acre felled is replanted, it will be many years before the present output can be repeated."

The sub-committee point out that, among other advantages which may be expected from the adoption of an extensive national scheme of afforestation are the following:

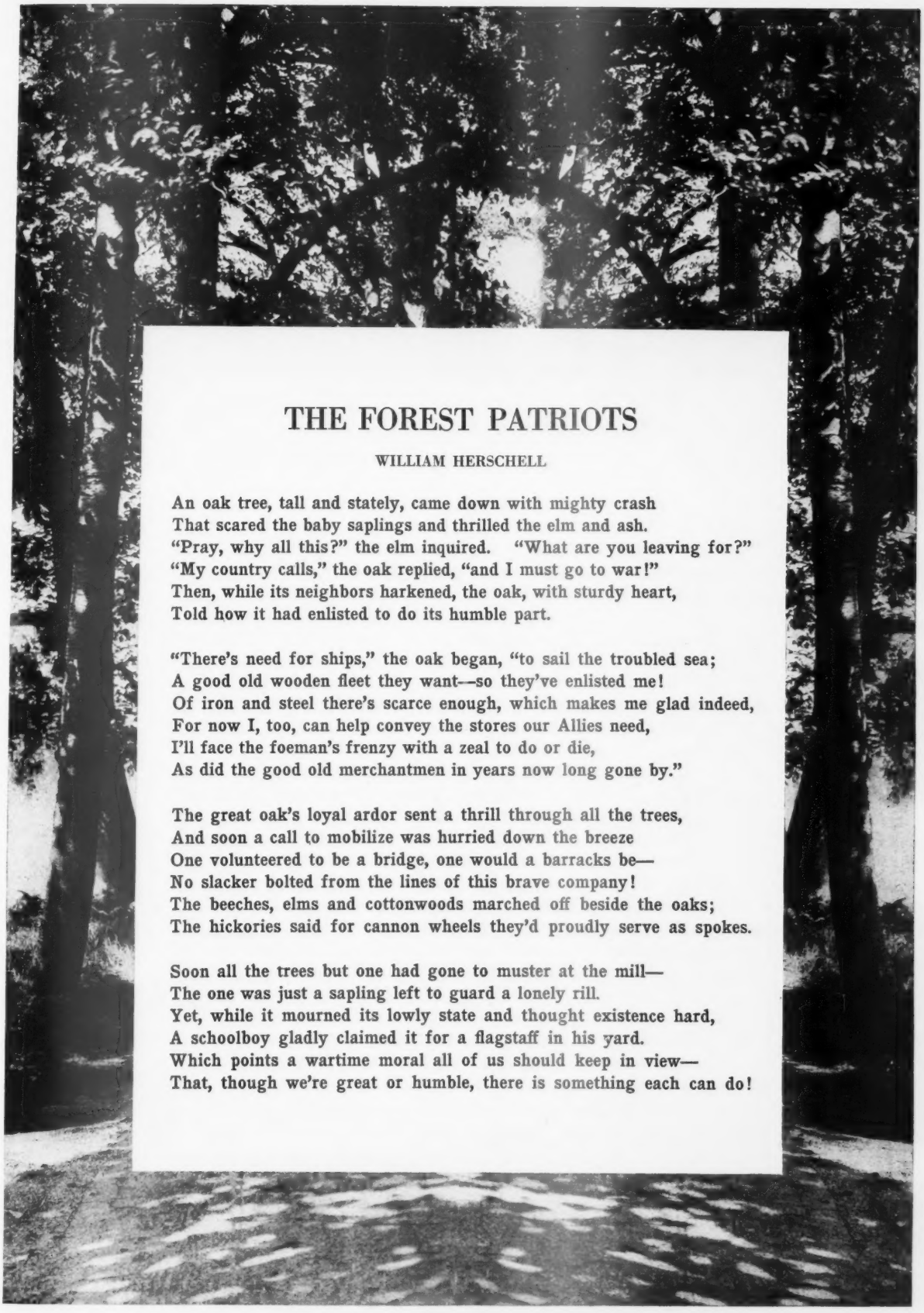
That by afforesting only a portion, namely, 2,000,000 acres, of the 4,000,000 or 5,000,000 acres available (without encroaching on food producing land, we should, in from fifty to sixty years, be largely self-supporting in the matter of timber, both for military and commercial purposes, and to a great extent independent of imported timber.

That this would result in : (a) The retention of money at home for expenditure on a home industry of great importance; and (b) The profitable utilization of very considerable areas of land in this country now almost entirely unprofitable.

That afforestation would provide employment for an increased rural population, and that such population would also be available for agriculture and food production, either on farms or small holdings.

That the employment of a larger rural population under the best and healthiest conditions would result in great benefit to the general health and well-being of the nation.

It is announced that the Minister of Reconstruction is now giving careful consideration to the report with a view to ascertaining how far and by what means effect may be given to the sub-committee's recommendations.



THE FOREST PATRIOTS

WILLIAM HERSCHELL

An oak tree, tall and stately, came down with mighty crash
That scared the baby saplings and thrilled the elm and ash.
"Pray, why all this?" the elm inquired. "What are you leaving for?"
"My country calls," the oak replied, "and I must go to war!"
Then, while its neighbors harkened, the oak, with sturdy heart,
Told how it had enlisted to do its humble part.

"There's need for ships," the oak began, "to sail the troubled sea;
A good old wooden fleet they want—so they've enlisted me!
Of iron and steel there's scarce enough, which makes me glad indeed,
For now I, too, can help convey the stores our Allies need,
I'll face the foeman's frenzy with a zeal to do or die,
As did the good old merchantmen in years now long gone by."

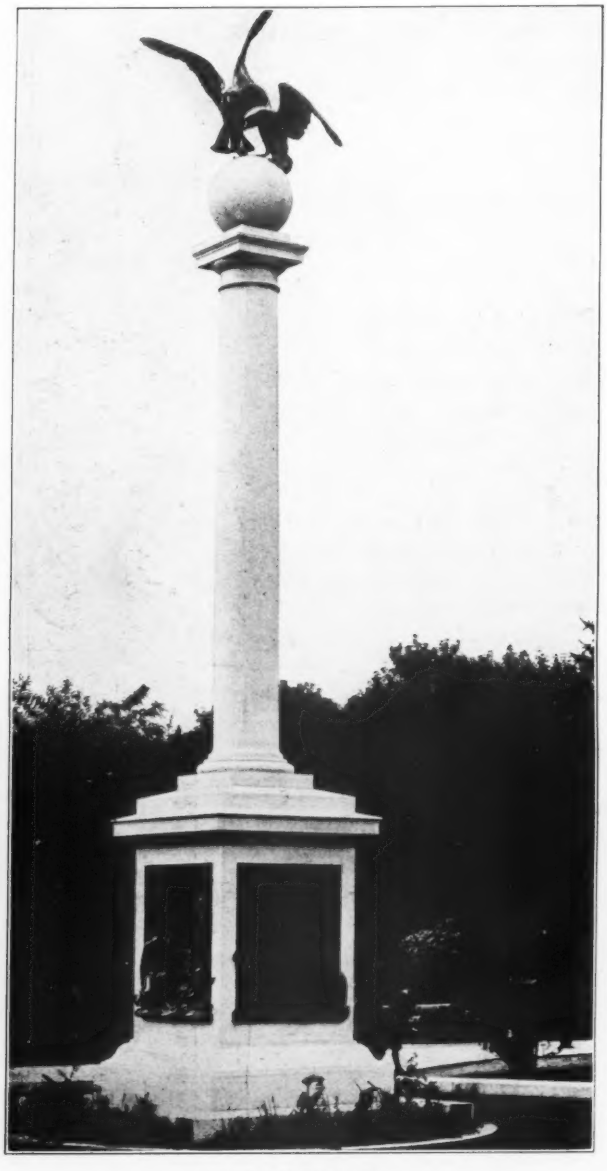
The great oak's loyal ardor sent a thrill through all the trees,
And soon a call to mobilize was hurried down the breeze
One volunteered to be a bridge, one would a barracks be—
No slacker bolted from the lines of this brave company!
The beeches, elms and cottonwoods marched off beside the oaks;
The hickories said for cannon wheels they'd proudly serve as spokes.

Soon all the trees but one had gone to muster at the mill—
The one was just a sapling left to guard a lonely rill.
Yet, while it mourned its lowly state and thought existence hard,
A schoolboy gladly claimed it for a flagstaff in his yard.
Which points a wartime moral all of us should keep in view—
That, though we're great or humble, there is something each can do!

A MONUMENT TO SEA GULLS

BY H. E. ZIMMERMAN

A REMARKABLE monument now has place on the grounds of the Mormon temple in Salt Lake City, Utah. It is a shaft that cost $40,000, and was raised in honor of the sea gull. Because such birds saved the Mormon pioneers from a plague of grasshoppers they are regarded with a reverence almost equal to that paid to the sacred cow in the Orient. It was when the Mormons had first come to the Salt Lake Valley, in 1848, that the grasshoppers visited them. They had much difficulty in irrigating the arid land of the Salt Lake Valley, and their food supply was almost exhausted before the time for the first harvest. Then the pests appeared and it seemed that everything would be destroyed, and that they must face starvation. Flocks of sea gulls, however, came from the great Salt Lake and elsewhere and, showing no fear of the people, destroyed the grasshoppers. At the time the Mormon leaders declared that this was a sign from Heaven that they had come to the chosen land of modern days, and later generations have not been permitted to forget the miracle. The laws of Utah provide severe penalties for any one who kills a sea gull, and they have been permitted to breed unmolested about the inland sea.



THE MONUMENT

For sheer beauty of design and purity of outline, it would be difficult to find the peer of this monument, erected in honor of the gulls.

The State would have helped pay for this shaft, but the church declined aid. The sculptor chosen was Mahonri Young, a grandson of Brigham Young, who has studied in Paris, and whose work is known among artists abroad as well as in this country. In recent years he has lived in New York.

The monument is 36 feet high, and is surmounted by a ball of granite from the Utah mountains, on which a huge gull, fashioned from pure white marble, alights. The square base of the shaft has four beautiful panels. One shows a pioneer camping for the first time in the valley. The second shows him following a plow, in turn followed by gulls; the third shows a harvest scene with the gulls eating the grasshoppers, and the fourth tells of the miracle of the gulls' visit.

GOVERNMENT JOBS FOR QUALIFIED MEN

THE United States Civil Service Commission announces that the Department of Agriculture is in urgent need of assistants in white-pine blister-rust eradication, at entrance salaries ranging from $1,200 to $1,440 a year. These positions are open to men only. The duties of assistants in white-pine blister-rust eradication are scouting for white-pine blister-rust, directing squads of men on blister-rust eradication, and in some cases conducting, under supervision, investigations of methods of eradication of this disease. For these positions certain specifications are made as to education and experience. Applicants will not be required to report at any place for scholastic tests, but will be rated upon their education, training and experience, as shown by their applications and corroborative evidence and upon theses submitted with the applications. Full information and application blanks may be obtained by addressing the United States Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. Civil Service examiners at Boston, New York, Philadelphia, Atlanta, Cincinnati, Chicago, St. Paul, St. Louis, New Orleans, Seattle or San Francisco.

RICHARD T. GUTHRIE DECORATED

CAPTAIN Richard T. Guthrie, formerly Forest Examiner in District 2 of the U. S. Forest Service, now a member of Battery E, 17th Field Artillery, which is brigaded with the French Army, was decorated on May 7th with the Croix de Guerre. Captain Guthrie resigned from the Forest Service early last spring and entered the regular Army.

CONSERVING OUR FOOD SUPPLY

BY CHARLES LATHROP PACK

PRESIDENT, NATIONAL WAR GARDEN COMMISSION

JUST the other day Mr. Hoover, the United States food administrator, warned the American people that in spite of a promised bumper wheat crop there would be no relaxation in the regulations affecting the use of this cereal.

What does this mean? It means that conservation of food must continue. There must be no let up in the fight to keep ahead of the threatened famine which is ever stalking close in the rear. If there is to be a constant and steady supply of food for shipment to Europe to take care of the Allies and the American army, there must be saving here.

How near famine comes to the peoples of Europe is pointed out in an editorial in a recent number of the continental edition of the American Daily Mail, published in Paris, which declared that England must be "prepared not for the best but for the worst," and then added: "When we are told by those who are best qualified to judge that we may be compelled during the next twelve months to eat potatoes instead of bread, we have got to make sure of the potatoes. In the days to come they may stand between us and starvation."

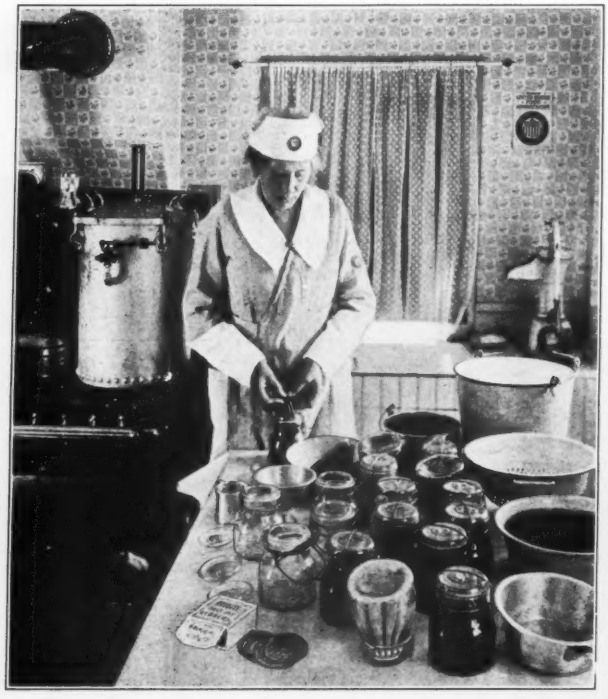
It is only by conserving during the summer that a sufficient supply can be laid aside for winter use. If there were no looking ahead, if all the crops were consumed as fast as they ripen or allowed to go to waste, grim famine would soon have the entire world in his grasp. Even after the war's end the food situation will be critical for a long time, for it will be many months, years in hundreds of thousands of cases, before the men

IN THE SECOND LINE OF DEFENSE

In thousands of homes all over the United States strong, true, loyal-hearted women are hard at work helping to win the war. They know that the work they are doing in the "kitchen trenches" is just as important as that which their sons and brothers and husbands are doing at the front. This shows a southern war gardener, Mrs. George Calhoun, of Murfreesboro, Tennessee, preparing for a large supply of Food F. O. B. the Pantry Shelf.

are back in normal channels of productive labor. Conservation must continue not only during the war but after its close, if the needs of the various peoples are to be taken care of.

The people of the United States have had the necessity for conservation called to their attention in many ways. They have not felt the food shortage as have the inhabitants of many other countries. In England, for



SHE HAD NEVER CANNED BEFORE

Mrs. John Totterdale, of Stafford, N. Y., whose husband does the war gardening end of the work, confesses that she had never had any previous experience in canning until the importance of raising and saving food in this way came to her attention through the campaign of the National War Garden Commission. Her case is like that of thousands of other American housewives who are doing their share in spite of previous inexperience to help in the great fight for right and freedom.

instance, so great is the shortage of meat that people buy bones at the butcher shops at the rate of five pounds for one shilling. In the United States bones and even precious scraps of meat go into the garbage pail. But more and more have the people here come to realize the vital part they can take through conservation in helping to win the war.

The demands of Europe have become more and more pressing and with a constantly increasing American army on foreign shores, the call for food has grown. The French army had prepared this summer to take care entirely of its need for vegetables and greens through the war gardens which had been planted back of the line; but these along with a lot of land which the British army was cultivating for a similar purpose were destroyed in the German drive. This meant that the food had to be procured from other sources.

The American army has set a fine example to the people of this land. The soldiers are helping to feed themselves. War gardens have been planted at most of the camps and much of the food now being grown there will be stored away for winter use. This work was started at Camp Dix, New Jersey, where early in May the National War Garden Commission planted a "real war garden" of 400 acres. Similar projects were soon under way at other camps. With the American soldiers ready to serve their country not only in the fighting line but in the production and conservation of food, the duty of those back home is plain. If the war is to be won there must be continual saving. All the products of the summer gardens that are not needed as they ripen, must be preserved for winter use. There must be "winter gardens" on the pantry shelves as well as "summer gardens" at the kitchen door. The garden can be made to supply a large part of the family's food during the entire twelve months of the year.

In looking back over the four years which have passed since the titanic struggle began, we see how each year there has been less to eat and prices have been higher. It is not a temporary or local scarcity with which we

BACKING THE BOYS "OVER THERE"

This is what all the women in the United States are doing who are helping to save the food which is grown in the war gardens so that the vegetables may be substituted as far as possible for the beef, wheat and other concentrated products which must be shipped abroad. This shows Mrs. E. Guy Mundy, of Mt. Carmel, Illinois, busily engaged in packing away "ammunition" for future use.

have to deal. On that account it is not enough for anyone to conserve merely what may be needed for his own or his family's use. If there is more surplus from the war garden than the individual needs, the balance should be given to some one else, sold or conserved by canning or drying for some future use.

Reports to the National War Garden Commission, which is affiliated with the American Forestry Association through its Conservation Department, indicate that

the big record made last year in the home conservation of food will be far surpassed this season. These reports show that there will be at least a doubling in the amounts of vegetables and fruits canned and dried. Last year there were between 450,000,000 and 500,000,000 jars of garden products stowed away on the pantry shelves. The summer and fall of 1918 will see more than a billion cans thus saved.

are allowed to do their canning in the company's kitchen.

This work can be carried on at little expense, as a small shed somewhere near the factory serves for the purpose and the water needed for the canning is heated by waste steam from the factory. Necessary material is furnished to the home food conservers at cost, and local food conservation committees and others interested in this end of the campaign can co-operate and assist.

A WAR GARDEN CANNING PRIZE WINNER

Mrs. Mary Williams, of Danville, Illinois, was an inspiration to the women of her community in the home production and conservation of food. Fifteen ribbons to her credit attest to the merit of the canned vegetables and fruits which were stored away on her pantry shelves, these being the surplus products of her war garden.

Canning kitchens and plants have been established in many places by large manufacturing concerns who are helping their employees not only to plant war gardens but to preserve all the surplus supply for winter use. Frequently this is being made more or less of a community affair, and as the opportunity offers people in the neighborhood who are not employees of the plant

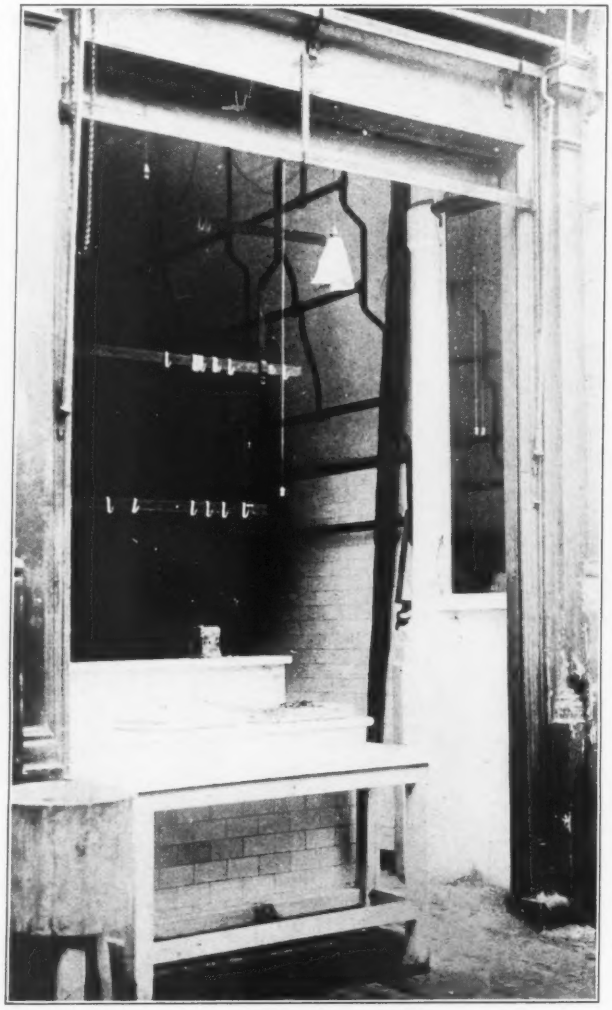
A quite complete illustration of what industrial concerns are doing in this direction is furnished by Wright Shovel Company, in North Anderson, Indiana. Arthur B. Birge, manager, recently purchased a complete canning outfit and had it installed in a summer kitchen, screened all around, clean, sunny and sanitary. He ordered a large supply of cans which will be furnished

at cost to all those taking advantage of the company's offer to use its canning kitchen.

A capable woman has been placed in charge to instruct those who need help in their work, who will give instructions in the cold pack method of canning vegetables and will teach the wives and daughters of the employees the best way to preserve vegetables and fruits. Food Inspector Teasley, the food conservation committees and others interested have been authorized to participate and assist in this community canning enterprise. A report from Mr. Birge shows that the company feels assured "of well fed, happy, healthy employees for the next winter."

Through the establishment of canning kitchens and community demonstrations and lectures explaining the methods of preserving vegetables and fruits, by the work they are doing in their own kitchens, by the words of patriotic encouragement they are giving to their friends and neighbors, by talks before clubs and at schools, and in various other ways, the women of the country are doing their part in the most essential work of saving the products of war gardens.

Instance after instance is recorded of home gardeners who had never before done a stroke of garden work who not only supplied their summer needs but who put up enough of the surplus to last them through the winter and until well into the summer season this year. The value of this, not only to the individual but to the nation, has been vividly impressed upon hundreds of thousands of other food producers this year.



Official Press Bureau, London

BUTCHERS' STALLS QUICKLY EMPTIED

With only a small quantity of meat on hand to start with, it is not long each day before the shops of the British food merchant are empty. Not a scrap of any kind is allowed to go to waste. It cannot be expected that a country in such straits to feed herself can be expected to contribute to the support of hundreds of thousands of American troops now on the other side; and so the people here must save to "keep the food following the flag."

"Keep the Home Fires Burning" has taken on a new meaning. Over those sacred patriotic fires the women of America are preserving the food which is being grown in their war gardens so that there may always be plenty for the boys "over there" and that they may never go without their "chow." When Pershing flashed his message across the Atlantic to "Keep the Food Coming," the women responded to the call by getting the home canning outfit ready. While there are many other lines of work in which they are helping to win the war, they have realized that none is more important than that of adding to the nation's food supply. And so they are donning their aprons and caps, getting out the old wash boiler and going in for canning and drying.

"We would never have thought of raising our own vegetables except for the war," writes Mrs. W. C. Norris, of Youngstown, Ohio, to the National War Garden Commission in a report on her garden and canning work. "It will interest you to know how I used the same space over and over again. It is marvelous the quantity we raised on so small a patch of 'waste ground.' My children and myself won prizes on canned vegetables.

"Our garden tract consisted of a small plot of ground about 50 feet wide by 120 feet long which was formerly a piece of neglected ground covered with wild grass and weeds. From early spring till frost we had a continual and bountiful supply of the following: green onions, beets, white cabbage, potatoes, lettuce, carrots, red cabbage, sugar corn, peas, tomatoes, navy beans, turnips, celery and string beans. We also raised a large quantity of sunflowers for seed to feed the chickens and which added considerable beauty to the garden.

"We put in the cellar the following raised from this garden: 32 pumpkins, 10 bushels potatoes, 1 bushel carrots, 1 bushel turnips and 5 quarts navy beans. In addition I also canned for the winter as follows: 35 quarts tomatoes, 10 quarts cold packed beans, 1 gallon salted string beans, 4 quarts string beans pickled, 6 quarts pickled beets, 6 quarts mixed vegetables for soup. I am very thankful for this opportunity to do something for the welfare of our country."

"I had to learn by experience," writes Mrs. John Totterdale, of Stafford, New York, and then she goes on to tell of the great variety of vegetables she put up

in one season alone, more than twenty different kinds.

One thousand quarts, including 126 varieties, was the record from the war garden of Mrs. E. M. Hunt, Denver, Colorado.

These are samples selected from among thousands reported to the National War Garden Commission of the way in which the home food producers have been making their gardens supply not only their summer but a large part of their winter needs. Practically all of the women use the cold pack method in their canning. From Hamilton, who is city director of food production, is giving practically all her time to the war garden campaign, boosting not only the growing but the conservation of garden products.

Two of Mrs. Hamilton's four sons are in the military service of their country; and the only reason the other two are at home is because they are only nine and eleven years of age respectively. In a report to the Commission Mrs. Hamilton states that she has placed more than 11,000 vacant lots, equivalent to 600 acres, free of cost.

Official Press Bureau, London WHY AMERICA MUST SAVE

In England they are selling bones for food. The little boy here shown is looking over a "tempting display" of bones which are offered for sale at the rate of five pounds for one shilling. In the United States bones which could be used for soups and even precious scraps of meat still go into the garbage pail.

coast to coast women are actively engaged in the work and encouraging others.

Mrs. James Hamilton—no it's Major Hamilton, commander of the brigade of women who constitute the Oakland, California, women's army of the national and state councils of defense—offers a fine illustration of the vim and the enthusiasm which is being shown by the women in keeping the food following the flag. Mrs. Twenty-seven propagating beds were loaned by the City Park Board to help in getting the gardens started. Mrs. Hamilton was well fitted to take charge of this work, having completed three courses in agriculture in the University of California, while she is now completing a fourth.

"Besides having an abundance of fresh vegetables for the table all summer and fall I canned 327 quarts, and

in that quantity I have such a variety that we never tire of them," is the report from Mrs. H. E. Newton, of Mansfield, Missouri. From Fredericktown in the same state comes word that the Union Homemakers' Club canned 5,760 quarts of vegetables and fruits, an average of 378 quarts to each family.

Mrs. Newton goes on to explain that they were only "amateur" gardeners, and that their only expenditure was $1.85, of which one dollar was for ploughing and 85 cents for seeds. There was not a square foot which did not raise at least two crops; and in addition to the supply for the summer table and the large amount she canned, a considerable amount was sold.

MAKING IT HOT FOR THE KAISER

It is the women all over the United States who are doing the bulk of the work in conserving the food which is essential to victory. From her war garden Mrs. E. M. Hunt, of Denver, Colorado, preserved for winter use more than 1,000 quarts of vegetables and fruits, her display including 126 varieties.

"All of my canning was done in a home-made outfit, a wash boiler with a wire frame made to fit it," she says. And therein lies one of the fortunate features of the work. It is so simple that no housekeeper need have any hesitation about tackling it. The few simple rules to be followed are all explained clearly and concisely in the booklet on home canning and drying, of which the National War Garden Commission already has sent out hundreds of thousands and which will be sent free to anyone who writes for it, enclosing a two cent stamp for postage.

LINING UP THE "AMMUNITION"

A simple home-made canning outfit, a wash boiler with a wire frame made to fit it, can be as successful as any other in the food conservation work. Mrs. H. E. Newton, of Mansfield, Missouri, is here shown getting ready to help "Can the Kaiser." Last season from her small war garden in addition to supplying the family table, selling a considerable quantity and storing a lot, she preserved 327 quarts of various vegetables. "I had such a variety that we never tire of them," she reported.

Every bit of food that is raised must be saved. What cannot be eaten as it ripens should be preserved, for it would be just as foolish, just as unpatriotic to grow millions of dollars worth of vegetables in our war gardens and then allow a lot of it to go to waste, as it would be for the government to build ships and then allow them to swing idly in our harbors or to manufacture airplanes and guns and ammunition and then not ship them to France where they are needed. We know the women of America are going to do their full patriotic duty in this direction. They will carry out the slogan on one of our posters, drawn by the Belgian soldier artist Verrees, who was wounded in Flanders: "Can Vegetables and the Kaiser Too." When this was written the German troops for the first time had crossed the Marne but were promptly driven back by American forces fighting by the side of the French. These men are enduring all kinds of hardship and facing death that you may be safe in a land of happiness and freedom. What less can those who stay at home do than to help provide the food needed by the boys over there? Every bit that can be saved should be canned or dried. In this the women of America *must* take the leading part. They will not fail their country in its day of need.

It has been pointed out that in England an entire ship, complete from keel to steering wheel, could now be turned out by women, without one particle of assistance from men. The women of Europe have gone much farther than the women of America in performing all kinds of service. As the war progresses and as big gaps are created in the industrial ranks by the draft and other causes, it is inevitable that the women of the United States will be called on more and more to take up duties which hitherto have been assigned solely to men. Industry here already has absorbed many thousands of women; and other thousands are ready or in training for other branches and occupations.

But in the meantime until they are summoned from their homes by the urgent call for more war workers to handle lathes and saws, to drive the trucks and tractors and to speed the ships on their way, the women here can continue a most valuable and essential war work at home. That is in the conservation of food. It is not necessary to point out the importance of this service. That is realized by everybody. Food is the foundation upon which all other activities rest.

And the supply cannot be too great. An editorial in a recent issue of a Parisian daily said: "It is a fact that no country can produce too much." That expression contains a great lesson for Americans. There must be production and conservation "without limit."

Official Press Bureau, London WHAT ENGLAND IS FACING

America has not yet seen any such lines as this patiently waiting for the chance to enter a food shop and buy a small quantity of food. The British "bobby" regulates the queue of pinched-faced women and children who stand in front of the scantily supplied store. A few cans of condensed milk and a box or two of corned beef are probably all that are "displayed" in the shop window.

"Even if the greatest expectations are realized," says Henry B. Thomson, chairman of the Canada Food Board, "the fact remains that the world reserves of wheat are exhausted. The greatest care will have to be taken to re-establish these reserves both here and abroad. It will be absolutely necessary to continue conservation and substitution at least until the 1919 crop situation is known."

THREE WAR SCYTHES NOW HANG IN ONE TREE

BY H. E. ZIMMERMAN

NEAR Waterloo, New York, stands one of the most interesting trees in this country. In October, 1861, fifty-seven years ago, James Wyman Johnson, who had a farm outside this city, hung his scythe in the crotch of a tree and went off with a New York regiment to the Civil War.

"Don't touch the scythe until I come back," he told his wife.

He never returned. In deference to his wishes the scythe was allowed to remain where it had been placed. When the scythe was placed on the tree by Mr. Johnson,

THE TREE OF THE SCYTHE

And now two more have been hung on the same tree, by two lads who have gone to fight for Democracy in the present great conflict.

the tree was only 8 inches in diameter, while it is now 13 feet in circumference. Only 7 inches of the scythe now protrudes, and strange to say, points in the direction of Johnson's grave in the South where he was buried. All except the scythe blade was removed some years ago. The local Relief Corps keeps the stars and stripes floating above the scythe.

Now two more scythes keep it company. On the day the United States entered the war Raymond L. Schaeffer, son of the present owner of the place, hung up his scythe and donned the olive drab. Today his brother, Lynn, placed his scythe alongside it and went away from Auburn in the navy's blue.

NEW PURCHASES OF LAND FOR THE EASTERN NATIONAL FORESTS

THE National Forest Reservation Commission has just approved for purchase 54,672 acres of land for National Forests in the White Mountains, Southern Appalachians and Arkansas. All of these lands solidify the Government holdings and carry out the present policy of the Commission to consider no lands which do not tend to block in with others previously approved for purchase.

The largest tract is one of 31,667 acres in Polk County, Tennessee. It fills out the entire southern end of what is known as the Cherokee Purchase Area. The price approved was $6 an acre. A large portion of this tract is well timbered; there is more than 20,000,000 feet of merchantable timber on the entire tract.

On the Natural Bridge Area, in Rockbridge, Amherst, and Bedford Counties, Virginia, there were approved 3,990 acres at an average price of $5.52 per acre. The largest tract included is one of 1,800 acres in Rockbridge County. There were also approved 4,058 acres in Shenandoah, Highland, Augusta, and Frederick Counties, Virginia, and 134 acres in Hardy County, West Virginia, at an average price of $6 an acre.

In the White Mountains 2,756 acres in Grafton and Coos Counties, New Hampshire, was approved, at an average price of $10.80. These lands contain considerable valuable spruce timber.

On the Unaka Area, in Unicoi County, Tennessee, the purchase of one tract of 3,000 acres was authorized, at a price of $4 per acre. There were also approved for purchase 28 different tracts embracing 6,200 acres, in Winston and Lawrence Counties, Alabama, at an average price of $4.38 per acre, and 2,552 acres in Avery, Watauga, Caldwell, Burke and McDowell Counties, North Carolina, at an average price of $5.15 an acre. In Arkansas 997 acres were approved for purchase in Pope, Montgomery, Garland, Perry and Polk Counties, at an average price of $2.86 per acre. These are the first lands to be acquired in Arkansas through purchase. They block in with lands in the Arkansas and Ozark National Forests, which were created by the reservation of lands formerly a part of the public domain.

CAPTAIN RINGLAND TRANSFERRED

INFORMATION has just been received that Captain A. C. Ringland, Regimental Adjutant for the 10th and 20th Engineers (Forest), American Expeditionary Forces, has been transferred to combatant service with the Pioneer Engineers, after having taken a two-weeks' training course. It is reported that Captain D. T. Mason will succeed Captain Ringland as Regimental adjutant.

THE HAWAIIAN LEHUA

BY VAUGHAN MacCAUGHEY

PROFESSOR OF BOTANY, COLLEGE OF HAWAII, HONOLULU

THE tree which is known to the Hawaiians as *ohi'a lehua,* or more commonly as *lehua,* is the most abundant of the indigenous Hawaiian trees. The statement that it probably exceeds in number all other arborescent species combined would not greatly err from the truth. It is ubiquitous in its distribution, and remarkably persistent in its growth. It is one of the first invaders of new areas, as for example, regions devastated by lava flows, and is one of the last species to succumb to unfavorable conditions. Over large tracts of the Hawaiian forests it is a dominant tree; in some regions it forms large and almost pure stands; one of the lesser isles is named for it. Since the earliest times the *lehua* has been closely associated with the life of the primitive Hawaiians. The showy scarlet flowers are among the most beautiful of the Hawaiian blossoms; of these the natives twine lovely garlands; the *lei lehua* is a favorite theme in many Hawaiian chants and love-songs.

A BEAUTIFUL AVENUE OF ROYAL PALMS AND WINE PALMS

This is Beretania Street, in Honolulu, and it is typical, for Honolulu is a veritable palm garden. Here are found representatives of some eighty different species, which have been gathered from all parts of the tropics, scarcely a home or yard being without its palms.

The *lehua* is one of the very few native trees that yields timber of commercial importance, and that has been exploited by lumber companies.

The *ohi'a lehua* is thus seen to occupy a prominent place in the Hawaiian forests and flora, and the present paper is an effort to present the salient facts concerning this interesting tree. During a ten year's residence in the islands, the author has had opportunity to visit and explore repeatedly the *lehua* forests on the various islands. Furthermore, the Hawaiian chants and legends abound with references to the *lehua,* and some of this extremely interesting folk-material is incorporated in this paper, being presented in this form for the first time.

THE "MOTHER" OF THE LEHUA

So native tradition has it. This beautiful tree fern, thirty feet high and three feet in diameter, is growing on the Volcano Road, Hilo.

A few words concerning the myrtaceous genus Metrosideros, of which *polymorpha* is a prominent member. The name is from the Greek, literally "iron-womb" or "heart," referring to the hard, heavy heart-wood that characterizes members of this genus. There are about twenty species, chiefly confined to the islands of the Pacific, from New Zealand to the Hawaiian group. One species occurs in tropical Australia and another in South Africa. It is interesting to note that eight fossil species have been discovered, one from the Middle Cretaceous of Greenland, the others from the European Tertiary. The living species are mainly trees or shrubs; some of the South Pacific forms are lianas. Several rather remarkable species are climbing during the juvenile state, and later become self-supporting. The Hawaiian *lehua* shows traces of this habit. The leaves are opposite and pinnately veined; flowers usually showy, prevailingly red, and strongly marked by their crown of very numerous, long, erect stamens; flowers borne in dense terminal three-forked cymes; ovules arranged in many series, horizontal or ascending.

The primitive Hawaiians were excellent botanists, in their way, and had distinctive names for a very large proportion of the wild plants. They knew the forests minutely, and had a comprehensive plant lore. There are many evidences of an incipient Polynesian binomial system for the naming of natural objects, trees, birds, fishes, seaweeds, and the like, and the *lehua* well illustrates this. *Ohi'a* was the generic term, applied to a number of myrtaceous trees in *Eugenia* and *Metrosideros.* To this generic term was added a specific name, as follows:

Ohi'a ai.....Eugenia malaccensis.
Ohi'a ha.....Eugenia sandwicense.
Ohi'a lehua...Metrosideros polymorpha.
Ohi'a lehua...Metrosideros macropus.
Ohi'a ahihi...Metrosideros tremulides.
Ohi'a papa...Metrosideros rugosa.

Furthermore, varieties within the species were carefully discriminated by the keen-eyed Polynesians, and we find such terms as *Lehua makanoe, Lehua kumakua, Lehua mamo, Lehua lau-lii, Lehua pua-kea,* etc. The accuracy with which the ancient Hawaiian used his biological vocabulary, particularly with reference to nomenclature, has evoked the surprise and admiration of the Occidental scientists who have visited the islands.

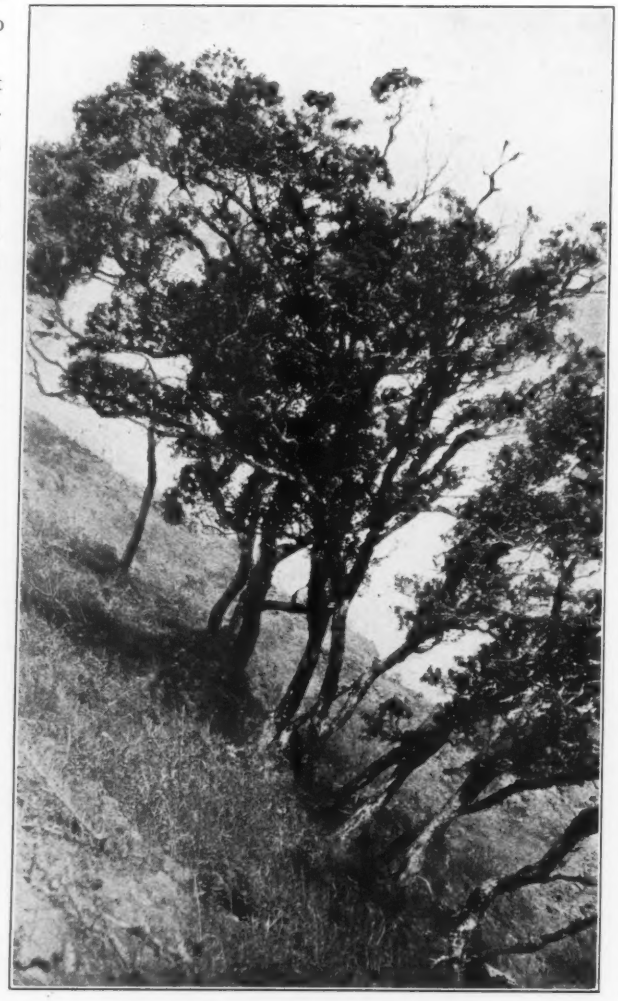
The specific name of the *lehua, polymorpha,* is most appropriate. No other plant species in the Hawaiian flora manifests so wide a range of variability, especially as regards habitat, habit, and foliage characters. This species is not endemic to the Hawaiian Islands, but is

DEEP IN THE LEHUA FOREST, ON THE BEAUTIFUL FERN-TRAIL

This is the most abundant, important and distinctive tree of the Hawaiian Islands, and it is one of the very few native trees that has been exploited commercially. Around it are gathered a great many of the old Hawaiian legends and folk-tales.

plentiful in the South Pacific. In Fiji it is called *Vuga;* in Tahiti *Pua-rata;* in New Zealand it is known by the Maori names *Rata* and *Pohutu-kawa.* Its great variability has been a source of much confusion and vexation to taxonomists as is manifest by the large number of names under which it has been described. A thorough taxonomic study of the species will undoubtedly reveal series of variations along well-defined lines, and probably also extensive hybridization.

The *lehua* is the most abundant and widely dispersed tree in the Hawaiian Archipelago. It occurs on all the islands, on both windward and leeward slopes, and at all elevations from sea-level to nearly ten thousand feet. It occupies a wide variety of ecologic habitats, lowlands, valley floors and slopes, summit—and lateral—ridges, precipices, peaks, summit bogs, lava flows both new and ancient, cinder and tufa cones, pit craters, almost every type of station, from extremely hygrephytic to extremely xerophytic, that the islands afford. However, it is never strictly littoral, nor does it thrive in exposed windy places. The finest and largest forests occur in the rain-forest belt along the windward slopes of the island of Hawaii, the flanks of the great volcanic mountains Kea, Loa, and Kilauea. Many of the primitive Hawaiian songs contain references to regions famous for their *lehua* groves. The Puna and Oláa districts, on Hawaii, for example, have magnificent forests composed mainly of this species. The following selections are typical:



HOLDING THEIR POSITION AGAINST ODDS

Lehua trees clinging to a steep slope where they are being gradually undermined by erosion. The tenacity and endurance of this tree is remarkable.

"The voice of Puna's sea resounds
Through the echoing hala groves;
The *lehua* trees cast their bloom."

This and all the other excerpts contained in this paper have been selected and re-arranged from the scholarly translations of Dr. N. B. Emerson, whose researches in Hawaiian songs and folk-lore have been monumental, and of the highest accuracy. Today there are exceedingly few persons, either white or native, who know the ancient Hawaiian language. The modern language is degenerate, and most of the old lore is forgotten. The original of the above lines is

"O Puna kai kuwa i ka hala;
Pae ka leo o ke kai;
Ke lu, la, i na pua lehua."

Oláa and Hilo, adjacent to Puna, were also heavily forested with *lehua.*

"A woman strings *lehua*-garlands in Oláa." *"He wahine kui lei lehua i uka o Olaa."*

"At Hilo I rendevouzed with the *lehua.*" *"A Hilo au e, hoolulu ka lehua."* The following lines refer to a difficult passage through the dense *lehua* forests of Hilo, and to the making of a temporary shelter in the woods:

"Ohi'as thick-set must be
brushed aside,
To tear one's way, like a
covey of fowl.
In the wilds of Pa-ie-ie—
Lehua growths mine—
heart of Mokaulele.
A breaking, a weaving of
boughs, to shield from
rain."

"Ka lae ohi'a e kope-kope,
Me he aha moa la, kapale
pa laau,
Ka nahele o Pa-ie-ie,
Ku'u po'e lehua iwaena
konu o Mo-kau-lele.
Me ka ha'i laau i pu-
kaula hala'i i ka ua."

Pa-ie-ie is a well-wooded part of Hilo, once a favorite resort of the bird hunters, and celebrated in Hawaiian song. Mo-kau-lele is a wild jungle-covered region in the interior of the Hilo district.

North of Hilo, along the Hamakua coast, are the famous groves of Pana-ewa:

"Pana-ewa's rain beats down the *lehuas,*
A rain by the sea smites the halas of Puna."
"He ua kui lehua ko Pana-ewa;
He ua ma kai kui hala ko Puna, e!"

Hala is the native name for the Pandanus. On the island of Kauái, the wilderness back of Hanalei Valley, was a famous region, where the *lehua* abounds, known as Hanalei-lehua: "Perilous, steep, is the climb to Hanalei woods, *"Ku piliki'i Hanalei-lehua, la."*

The *lehua* is exceedingly variable in its habit of growth. It ranges from a stunted creeper to a magnificent tree of eighty or one hundred feet. These differences are intimately connected, as is to be expected, with the various habitats of the tree. There are four main types:

1. *Prostrate or creeping plants,* vine-like, and confined to the summit bogs, at elevations of 4000-6000 feet. These have flexible woody stems, about one-quarter inch in diameter, and rooting freely toward the base. Although attaining a length of only six to eighteen inches, they produce numerous flowers. This remarkable dwarf form is called *Lehua makanoe* by the Hawaiians, literally "The *lehua* in the fog," for it grows only in these water-soaked, fog-swept, summit swamps. Heller described the stunted, prostrate summit *lehua* as *Nania pumila.* It grows amidst the tussocks of swamp grasses and sedges, and other characteristic summit bog plants.

2. *Bushes or shrubs.* In this form the plant occurs on the summit ridges, windward precipices, and other steep and unfavorable situations. Many of the arid lava-flow stations exhibit these retarded forms. They rise to a height of eight to twelve feet, and flower freely.

3. *Medium-sized trees.* This is the most characteristic form on all the islands except Hawaii, and it is abundant on the latter island. The *lehua,* in protected valleys and slopes, attains a height of twenty to forty feet. This is the habit commonly found in the rain-forests of Kauái, Oahu, Molokái, Lanái, Maui, and parts of Hawaii. The trunk is six to fifteen inches in diameter, and rises clear to a height of fifteen or thirty feet without branching. The crown is small, compact, and high, with the foliage crowded to the ends of the branches.

IN BEAUTIFUL HAWAII—THE GROUNDS OF THE QUEEN'S HOSPITAL, HONOLULU

This magnificent driveway is colonnaded with Royal Date palms which add an air of dignity and stateliness to an environment already incomparable from the standpoint of tropical beauty.

4. *Veteran trees.* As has previously been indicated, along the windward coast of Hawaii, from Kohala to Puna, but particularly in the latter district, the *lehua* reaches its finest development. This may be taken as

EDGE OF THE NATURAL FOREST

Most of the trees in this section are Ohia trees (*Metrosideros polymorpha*), Olinda Maui, Hawaiian Islands. Note the characteristic light bark.

the normal habit of the tree, the other types representing the direct effects of repressive conditions. In the region just specified are almost pure stands of *lehua,* rising to eighty or one hundred feet, with tall slender trunks, and a dense undergrowth of tree ferns (Cibotium). These are the finest forests in the archipelago, both from the standpoint of their beauty, and of the quantity of commercially valuable timber which they contain. In these forests the typical *lehua* has a trunk two to four feet in diameter, with or without aerial prop-roots, and branching at a distance of thirty to sixty feet above the ground. The crowns form a high dense canopy; the trunks are often covered with epiphytic plants and lianas; and the ground is very wet and spongy.

Lehua bark is light gray, irregularly fissured, and quite scaly on old trees. The gray color is so characteristic that by it alone the trunk may be recognized at a distance. The bark is relatively thick, even on young twigs and branches; on old trees it becomes an inch or more in thickness. The slow growth of the *lehua* causes the young twigs to be conspicuously marked with the close-set leaf-scars. This and other features give even the young trees an aspect of endurance and senility. Many of the Hawaiian tree species, especially at the upper levels, assume this appearance of great age at a very early stage; this is not wholly a matter of appearance, for most of the species are very slow-growing.

The *lehua* branches are often angular and gnarled; those of trees growing in the rain-forest are ascending and form a flat summit crown. Trees growing in the open, as on lava flows, have the branches more symmetrically disposed along the trunk. The branches are mostly of small size, but are tough and flexible. The *lehua* tree is rarely wind-shattered, whereas the *koa* (*Acacia Koa*) for example, is often badly disfigured by the wind. The *lehua* is slowly self-pruning, and old trees in the forest have clean smooth trunks rising to forty or fifty feet without a branch.

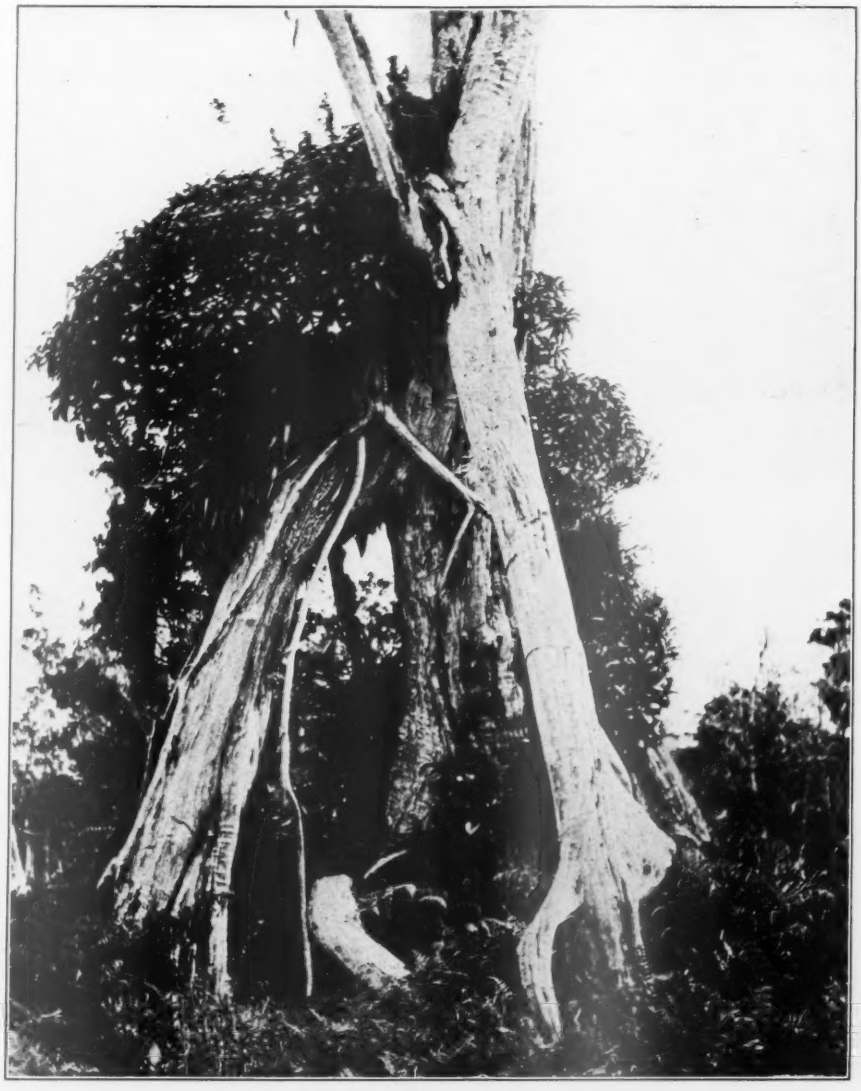
The wood is known commercially as *ohi'a,* although this is in reality a generic, rather than a specific name. When *ohi'a* timber or wood is specified, the term invariably signifies *ohi'a lehua.* The wood is strong, tough, fine-grained, and very durable. In color it is rich dark reddish-brown; the red tint is pronounced, and gives beautiful effects in hardwood floors and interior trim. In its mechanical and structural properties *ohi'a lehua* is comparable to the best oak, although it cannot be obtained in as large sizes. Occasionally boles of three or four feet in diameter are obtained, but these are rare, and the average diameter of the trunk is about two feet. Timbers cut from the more or less buttressed basal part of the trunk sometimes exhibit a beautiful curly or wavy grain, resembling the famous "curly *Koa*" used in the Hawaiian *ukuleles.* In recent years local companies have undertaken the commercial exploitation of the *lehua* forests, and large quantities of the lumber have been exported, as well as utilized locally. The *ohi'a lehua* is a slow-growing species, and upon the consummation of the present epoch of exploitation, unless conservative principles of forestry be applied, the supply, like that of the ill-fated Hawaiian sandalwood, will be practically exhausted for a considerable period of years.

The wood is used for flooring, paving blocks, railroad ties, bridge timbers, and other purposes in which durability is of special importance. Two drawbacks to

TYPICAL UNDERGROWTH IN A LEHUA FOREST

Tree-ferns are the most abundant and distinctive feature.

the use of *lehua* are, first, it can be obtained only in relatively narrow strips; and second, it requires very careful drying in order to prevent warping and checking, to which it is very susceptible. In laying *ohi'a* floors great care is exercised in fastening the boards securely in place, otherwise they warp and check. The natives used the wood for a great variety of purposes,—fuel; idols; framework of temples and houses; enclosures; spears, clubs and household tools; surfboards; the poles to unite the double canoes; and rarely for the body of the canoe itself. The trunk was seldom large enough for the latter use. The wood is an excellent firewood, as every Hawaiian mountaineer knows; it will burn even though partially wet, and produces a glowing bed of firm bright embers, like those of hickory or oak.



THE BANYAN-LIKE PROP ROOTS OF THE OHIA

Typical Ohia-Lehua with roots high above the ground. The Ohia germinates in the moist wooly trunks of tree ferns and, as it develops, sends its roots down along the fern trunks into the ground. As the tree grows larger the fern is lost in the stilt-like roots of the Ohia, finally dying and dropping away.

The roots of the *lehua* may be grouped under two classes, the ærial roots, and the true soil roots. The ærial roots are commonly developed by the *lehua* trees which grow in a sufficiently moist atmosphere. They are much more abundant on the uplands than on the lowlands, and in the dense forest than in the open. These ærial roots vary in size from fine reddish hair-like filaments, a few inches in length, to large bushy masses two feet in diameter and five to twenty-five feet tall. The ærial roots are emitted from the larger branches, as well as from the trunk itself. Although chiefly confined to the under surfaces of the branches, they often arise on the upper surfaces, and grow around the branch in order to point soilward.

The Hawaiians call the ærial root *a'a lewa-lewa*. In rugged mountainous regions the roots often aid the traveler by furnishing him with a sort of ladder. One of the ancient songs, already quoted, begins:

"Perilous, steep is the climb to Hanalei woods;
To walk canny-footed over its bogs;
To balance oneself on its ledges,
And toil up ladder of hanging roots."

Along the steep valley slopes and ridges of Kauái, Oahu, East Molokái, and West Maui where the smaller *lehuas* abound, one often finds trees with numerous banyan-like prop-roots radiating from the trunk and lower branches. These roots are usually two to six inches in diameter.

On the island of Hawaii the *lehua* is commonly associated with the tree ferns. As Rock states:

". . . the seeds of the *Ohia* trees fall on the moist woolly trunks of the tree ferns; there they germinate. At first the young tree finds enough nourishment in the humus, dead leaves, etc, which collect in the axils of dead fern leaves all along the tall fern trunks, but finally it sends its roots down along the fern trunks into the ground. As the tree grows larger and taller, the fern becomes enclosed between the stilt-like roots of the *Ohia* tree, until finally the fern dies and decays, leaving the stilt roots standing some 15 to 20 feet above the ground, after which the real trunk of the tree commences. Such stilt-like *Ohia* trees are very common in the Hawaiian forests, but mainly on Hawaii."

This interesting epiphytism in the juvenile state accounts for the native tradition to the effect that the tree-fern is the "mother" of the *lehua*. The primitive Hawaiian was a close observer of nature, and he perceived the relationship between *lehua* and fern, without fully comprehending its significance.

The true soil-roots of the *lehua* are as diverse in their extent as is the ærial shoot. In the dense rain-forest the soil roots are relatively shallow and scanty, although there is usually a strong tap-root. Out upon the xerophytic lava flows, however, the roots become very long, often penetrating the interstices of the lava for distance equalling two to four times the height of the tree.

The *lehua* leaves show a considerable range of variation as to size, shape, and pubescence. They are opposite, and usually crowded towards the end of the branches. The petiole is long or short, as compared with the blade. The blade is lanceolate, oblong, ovate, obovate, or orbicular; the apex blunt or acute; the base acute, rounded, or cordate. The venation varies from faint to strongly defined. The leaves may be glabrous throughout, or with varying amounts of whitish or gray tomentum, either on the lower surface alone, or on both sides. In texture the leaves are firm and coriaceous; the color is a dark green, more or less masked by the gray tomentum. The bracts of the leaf-bud are short, scarlet, and soon deciduous; the buds themselves are copiously clad with gray tomentum.

A MIXED FOREST OF KOA AND LEHUA

The wood is used for railroad ties, flooring and wainscoting and, to a small extent, in the making of furniture. The trees in the background are lehua. The large logs in the foreground are koa.

In the forest the *lehua* is easily recognized by the small, close-set foliage, and even at a great distance its peculiar shade of gray-green distinguishes it.

The young leaves are frequently flushed with crimson, and some early Hawaiian singer, noting this, has compared the beautiful many-hued ocean off the Kona coast to the changing colors of the *lehua* and *noni* leaves:

"Leaf of lehua and noni-tint, the Kona sea,
Iridescent saffron and red,
Changeable watered red, peculiar to Kona."

"Lau lehua punoni ula ke kai o Kona,
Ke kai punoni ula i oweo ia,
Wewena ula ke kai la, he kokona."

Any one who has visited the lovely Kona district, and has looked out over the peaceful sea at evening time, when the rich blue and green of the warm Pacific is suffused with the ineffable sunset tints, will fully appreciate the delicacy and accuracy of the poet's simile.

In the flowers in some forms the petals, as well as the sepals, are white-tomentose or woolly, the red color showing through the pubescence. The most common color is bright scarlet, but other tints, such as salmon-pink, orange-yellow, clear yellow, and white, are not uncommon. The Hawaiians recognized these color variations, and gave to them distinctive names, such as *lehua mamo*, the orange-yellow *lehua*, *lehua puakea*, the white *lehua*, etc.

The showy feature of the *lehua* flower, and to which the above color names apply, is not the corolla, but the graceful pompon of numerous stamens. These have long, free, brightly colored filaments, the colors varying as given for the petals, very graceful and delicate, and their bright scarlet clusters were beloved by the Hawaiians. The name *lehua* means literally "hair," and was applied by the Hawaiians to this tree because of the conspicuous hair-like filaments.

At the base of the flower, surrounding the ovary, are the nectar glands, which excrete a bountiful supply of sweet, fragrant nectar. This is an important item in the food of many of the native birds, as is explained in another paragraph. There is no other indigenous plant in the Hawaiian Islands that produces such large quantities of delicious nectar; its nearest rival is the introduced *kiawe* (mesquite, *Prosopis juliflora*). The *lehua* nectar not only attracts the brilliant-plumaged native birds, but also the wild bees and other insects. A *lehua* tree in full bloom is thus not only an object of great beauty, but also abounds with avian and insect life. The main

flowering season is spring and summer, but considering all elevations, trees may be found in flower at all times of the year.

One of the most pleasurable and interesting features of the Hawaiian *lehua* forest was its indigenous bird life. In primitive times the groves abounded with highly specialized and brilliantly colored species. The profound changes in the forest, brought about by the influences of civilization, have caused the extinction of many species, and have made many others exceedingly rare. However, even today, in the more secluded woodlands, as those of the Puna and Hamakua districts, Hawaii, and on the slopes of Haleakala, Maui, some of the native birds are fairly plentiful.

A PORTION OF THE GREAT LEHUA FOREST ON THE ISLAND OF HAWAII

The earthy hummock in the foreground is a bank of sulfur, near Kilauea Volcano. The trees are 30 to 60 feet high in this particular place. The prevalence of the lehua on the mighty flanks of active volcanoes has resulted in its destruction by the fiery lava rivers, a theme often dwelt upon by the native poet—"They are gray from the heat of the goddess." And again, "Consumed by the fire that flows from the pit."

The birds most intimately associated with the *lehua* are those that live chiefly upon the nectar. Several species are exceedingly fond of the nectar, and are usually found in the flowering groves. Foremost among these is the *akakani* or *apapani*.* This is one of the most beautiful and abundant of the native birds, and is found on all the islands. Its food consists almost wholly of nectar and small insects. The *akakani* has a pleasing habit of assembling in small groups in the summits of the lofty *lehua* trees about mid-day, when most of the other woodland birds are silent. The males then join in a subdued lullaby "and literally sing themselves and their mates to sleep." The song is sweet, persistent and monotonous, and is given at all seasons and all times of the day. The *akakani* usually nests in the tall forest *lehuas,* but sometimes chooses the scrubby *lehuas* in more open country. The *i'iwi* is another species fairly numerous and generally distributed throughout the *lehua* forests. It nests in the summits of the tallest *lehuas,* and chooses the most inaccessible places, out near the very tips of the slender branches. It may be remarked, in passing, that many Hawaiian birds locate their nests in very protected situations, in the highest trees.

The Hawaii *amakihi* is a nectar-loving species, and is frequently seen with the *i'iwi* and *akakani.* It also feeds upon minute insects, and spends much of its time searching the foliage of the *lehua* and low shrubbery. The crested honey-eater is confined to the high forests of Haleakala, above 5000 feet. Like the *akakani,* it frequents the *lehua* almost exclusively, and derives a large part of its food from the nectar. Its long, tubular, brush-tipped tongue enables this species to extract the nectar with great ease. It also feeds upon insects. Like most of the nectar-eating birds, its stomach is remarkably small for the size of the bird; nectar is easily and quickly digested. The *o-o* is a beautiful species, once occurring on all the islands, but now nearly exterminated. This species was one of several trapped by the primitive Hawaiians for the sake of their beautiful feathers, which were used in the manufacture of the priceless feather garments of Hawaiian royalty. The ancient chiefs and kings had regular staffs of bird-catchers, who were very expert. These men commonly made use of the viscid latex of the breadfruit, called *pilali,* or *olapa* (*cheirodendron saudichaudii*) gum, smearing it over the branches of a *lehua* tree, and often fastening there a dead *i'iwi* bird, to which the pugnacious *o-o* would be attracted. The word *"pa-lei"* was used to designate a *lehua* tree in full flower, which had been thus prepared as a trap. Often all the lower branches were stripped from the tree; the upper ones were limed. The dwarf

*Descriptions of these lovely and highly specialized species are not within the province of this paper, but may be found, together with excellent colored plates, in the sumptuous works of Wilson and Scott, "Aves Sandwichensis," and Rothschild's "Birds of Laysan and Neighboring Islands."

o-o is restricted to Kauai. It is fairly common at all elevations, and is nearly always found in flower-laden *lehua* trees.

The Hawaii *akialoa* is confined to the deep *lehua* forests of the Oláa district, and is now very rare. It haunts the tall *lehua* trees, feeding mainly on insects, which it finds in decayed timber, and also around the tree-ferns. The green solitaire is another exceedingly rare species characteristic of the very dense *lehua* forests of the Hilo region, at elevations of 2000 to 4000 feet. It feeds chiefly upon the insects which it gleans from the *lehua* foliage.

It would be wrong to close this section which deals with the birds of the *lehua* groves without some mention of the little *elepaio,* the most abundant and familiar of the native woodland species. Although occurring throughout the forests, and not confined to the *lehua* groves, the *elepaio* is abundant in the latter situations, and, like the other species enumerated, feeds upon *lehua*-nectar in season.

The Hawaiians were exceedingly fond of the *lehua* blossoms, and they are repeatedly mentioned in the chants and songs. These lines from an old chant present a vivid picture of the forests in full bloom:

"Puna's plain takes the color of scarlet—Red as heart's blood the bloom of *lehua.*"

"O Puna, lehua ula i ka papa; I ula i ka papa ka lehua o Puna."

Here is another poetic allusion to the *lehua* groves in the Hilo region; Hilo is compared to a beautiful maiden around whose neck are hung the scarlet garlands:

"The neck of Hilo is heavy,—weighted with wreaths of *lehua.*"

"Kaumaha ka ai o Hilo i ka lehua."

In the ancient ceremonies of the *hula,* the altar was heaped with flower-laden *lehua* branches. One of the prayers to remove *tabu* during the *hula* contains the following lines:

"Bloom of *lehua* on altar piled; bloom of *lehua* below; Bloom of *lehua* at altar's base."

And another song contains the line:

"Provide you wreaths of *lehua* to gladden the heart of travel."

An old song contains the line: *"Kauwa ke aloha i na lehua o Kaana,"* this Dr. Emerson translates "Love slaves for the *lehuas* of Ka-ana" and makes the following illuminating comment: "Ka-ana is said to be a hill on the road from Ka-ana to Oláa, a spot where travelers were wont to rest and where they not infrequently made up wreaths of the scarlet *lehua* bloom which there abounded. It took a large number of *lehua* flowers to suffice for a wreath, and to bind them securely to the fillet that made them a garland was a work demanding not only artistic skill but time and patience. If a weary traveler, halting at Ka-ana, employed his time of rest in plaiting flowers into a wreath for some loved one, there would be truth as well as poetry in the saying, "Love slaves for the *lehuas* of Ka-ana."

In another beautiful verse the native bard compares his sweetheart to the *lehua* flower, after the manner of many an Occidental poet:

"*Lehua* blooms pale at my flower—O sweetheart of mine,
Bud that I'd pick and wear in my wreath, if thou wert but a flower."

The prevalence of the *lehua* on the mighty flanks of the active volcanoes of Loa and Kilauea resulted in its being the foremost tree to suffer from the ravages of the lava flows. This condition made a deep impression upon the imagination of the Hawaiian bard and nature poet, and we find many references to the destruction of the lovely *lehua* groves by the fiery lava rivers:

"Scraggy the branching of La'a's *ohi'as;*
The *lehua* limbs at sixes and sevens—
They are gray from the heat of the goddess;
Puna smokes mid the bowling rocks."

The goddess refers to Pele, the savage mistress of the lava flows; the bowling rocks refers to the advancing lava flow.

"From the *ohi-a* covered promontory at Papa-lau-ahi,
To the *lehua* garlands heaped at Kua-o-ka-la,
The beauteous *lehuas* are wilted,
Scorched, burnt up, aye, burnt,
Consumed by the fire of the Woman—
The fire that flows from the Pit."

One of the most touching fragments of the primitive Hawaiian imagination that has come down to us is the legend of Hopoe, the charming damsel transformed by the jealous fire-goddess Pele into a charred *lehua* tree, standing forlorn on a desolate rocky coast. Along the arid Kona shore, for example, one finds these stunted, gnarled *lehuas,* ten to fifteen feet high, growing on the ancient lava-flows. The *lehua* is often referred to as "the *lehua* of Hopoe."

Directly north of the island of Niihau, and separated from it only by a narrow channel, is a tiny isle named Lehua. It is barren and uninhabited. The natives have the following legend to account for its name. When Pele and her associates first came to the Hawaiian Islands, they passed along the line of islets, reefs, and shoals that stretches to the northwest of the main group. When they came to the tiny isle Lehua, despite "its smallness and unfitness for residence, Pele was moved to crown the rock with a wreath of *kau-no'a,* while *Hi'i-aka* contributed a chaplet of *lehua* which she took from her own neck, thus christening it for all times.

"Sailed we away until we found the land we christened Lehua."

A very ancient love-song tells of the difficulties of two lovers, who finally sought shelter on Lehua. This ballad would seem to indicate that at one time the island was really forested:

"Storm sweeps the cliffs of the islet;
A covert they seek neath the hills,
In the sheltered lee of the gale,
The cove at the base of *Lehua.*
The shady groves there enchant them,
The scarlet plumes of *lehua.*"

THE USES OF WOOD

WOOD USED IN ROUGH CONSTRUCTION

BY HU MAXWELL

Editor's Note:—This is the third story in a series of important and very valuable articles, by Mr. Maxwell, on wood and its uses. The series will thoroughly cover the various phases of the subject, from the beginnings in the forest through the processes of logging, lumbering, transportation and milling, considering in detail the whole field of the utilization and manufacture of wood.

THE output of the country's sawmills may be placed at 40,000,000,000 feet a year, more one year, less another, but averaging about forty billion. This material goes to its final use in two classes. Rough lumber constitutes one class; the other class is dressed or otherwise further manufactured before it reaches its final place in utilization. The scope of the present article will be restricted so as to include little more than the wood belonging to the first division, the rough material, that finds place in the walls and frames of buildings. The finer work, such as the interior and exterior finish of houses is reserved for discussion in another article.

Probably half of the lumber sawed in the United States, or 20,000,000,000 feet a year, is required to meet the demands of builders. This includes both the rough lumber and that which is further manufactured. The structures which absorb this large lumber supply are of so many kinds that a list is out of the question, but belonging to such a list are residences, farm buildings, warehouses, stores, factories, educational and religious edifices, cottages and camps, to mention just a few of the most familiar.

SPLITTING PUNCHEON FLOORING MATERIAL

In pioneer days the best cabins were floored with thick split boards known as puncheons, smoothed with an adz. The process of making them is now nearly a lost art, but occasionally a manufacturer of such slabs plies his maul and wedges as in the years of long ago.

It is not wholly certain that one-half of the total lumber supply goes to the builder, but that estimate appears to be conservative in view of the fact that nearly one-third of the entire lumber supply is converted into planing mill products, and that builders are by all odds the largest users of such products which consist of dressed and partly worked material; and there is little doubt that if lumber used in its rough form is added to this, the total will be fully one-half of the total sawmill output. The two classes, rough material and millwork, are so mixed in use that they cannot afterwards be itemized separately.

The tendency now is to use more dressed stock than formerly, in proportion to that employed in its rough form. When carpenters were under the necessity of dressing all lumber by hand, or with small and simple machines, or use it without dressing, the temptation to follow the easiest course was strong, with the result that not a great many years ago it was not unusual to lay floors of unplaned boards in residences and other pretentious buildings; and the weatherboarding or siding sometimes went into place in the same rough condition. It was still earlier that the best cabins had split puncheon floors which had been smoothed with adzes.

To speak of the log houses of the pioneers would be harking back into the past rather farther than is necessary, were it not that such houses are with us yet. The log cabin did not disappear when the house of sawed lumber came in. Both kinds have existed side by side during three hundred years of American progress, and most people of today would be surprised if told how many log buildings are still in existence. Some are falling down because of age and neglect; some are being cared for and preserved for historical or sentimental reasons; and some log houses, strange as it may seem, are being built at this time. Buildings of this class are quite numerous, if the whole country is considered, but they are confined to timbered regions. Within a distance not

exceeding one day's ride on horseback among the mountains of West Virginia a traveler might recently have passed three log structures each more than a century old and all still in use. One was the Westfall Indian fort at Beverly, built during the Dunmore war in 1774; one was a barn near Parsons, built in 1814, and its original white pine shingle roof kept it dry during 102 years; and the third was a memorial church built prior to 1790 by a pioneer in memory of his child. A Methodist preacher still occupies the pulpit every Sunday, and the church still is known by the name of the child in whose memory

IN EXISTENCE BUT OUT OF DATE

Here is shown an old corn crib built of fence rails and puncheons and a roof of split clapboards. It is a survival of a type of farm buildings common in pioneer days among the southern Appalachian Mountains. This crib was half full of corn when the photograph was made in 1913.

it was built, "Ann Eliza." The building was weather-boarded half a century ago and the logs do not now appear in view. These venerable log structures are interesting chiefly as examples of the substantial character of the material of which they were built. They are not isolated cases, for, without doubt all forested regions of the eastern part of the country have similar old and venerable log houses whose periods of existence extend farther into the past than the memory of any living man can go.

The builders of log houses, particularly those of older date, did not worry themselves over any conservation questions. They used all the logs they wanted and took no thought of the morrow. The trees which they cut were seldom missed from the abundance in the forests. In this connection it may be of some interest to know approximately how much more material is required to build a log house than a plain board house of equal size. Measurements recently made of the logs in an average log house showed that had they been sawed into plain inch boards, six houses of upright boards (walls only) could have been built of the same material. It is evident that the log cabin builders made a pretty heavy demand on the forests, in proportion to the number of houses they built. They used logs, also, for barns, cribs, and other farm buildings, though in justice to the historical truth of the matter, it must be said that most of the pioneers were shiftless in regard to both residences and barns. Their horses and cattle too often roamed the snowy hills in winter with no other roof than the sky and clouds and no other bed than the snow, while the surrounding forests held enough timber to have shedded every hoof of stock on the place, without missing what might have been cut for barns. The primitive log buildings were seldom large, and nearly always pitifully small and mean. A halo of romance is often thrown round the

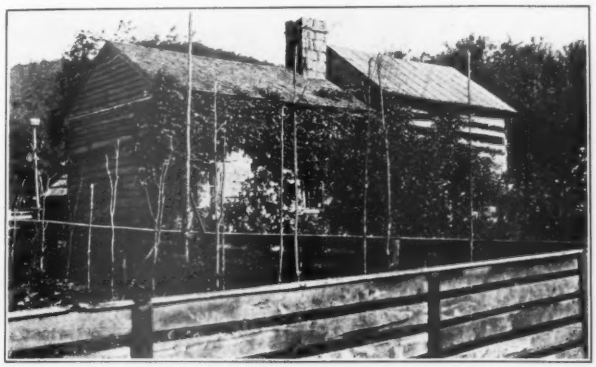
MEMORIAL LOG CHURCH COVERED WITH WEATHER BOARDING

This venerable edifice crossed the century mark years ago, and is still served by a Methodist circuit rider. It is claimed to be the oldest memorial church west of the Appalachian Mountains, built by a Revolutionary soldier, and named Ann Eliza, for his dead child. It stands at St. George, West Virginia. It is yet known by its original name.

memories of the frontiersmen, but if an impartial witness should judge them by the houses in which they raised their families, and by the barns that afforded all the shelter their horses and cattle got in winter, some of the enchantment which distance lends to the view would disappear.

Wood is an ideal building material. It has a few undesirable qualities, but it possesses a far greater number

that are excellent. It is strong, stiff and elastic, and in comparison with stone and brick, it is light. It is nearly impervious to water, and wooden houses are dry while those of brick and stone may absorb and transmit dampness. Wood is a nonconductor of heat, consequently houses of this material are warmer in winter and cooler in summer than are those of other common



A LOG HOUSE OF THE BETTER CLASS

This house, overlooking the Shenandoah Valley in Virginia, is about as good an example of a log dwelling as is to be found. The logs are hewed, the chimney is of cut stone, but the sheet iron roof betrays present day repairs. The building suggests a respectable old homestead.

building materials. It is a sound-absorber to a considerable extent, and in respect to quietness, wooden buildings compare favorably with others.

The color of wood is never offensive to refined tastes, nor is it trying on the eyes. That holds true whether it is the wood forming an old wall of logs, weathered by years of sun and storm, or whether it is the dressed and finished panels composing wainscoting, ceilings, or doors. The color rests the eyes and pleases the sense of beauty.

Wood is hard enough to resist satisfactorily the wear which the various parts of a building receive; yet it is sufficiently soft to be readily cut and shaped with tools, and it is in that respect ideal for building purposes. The axman quickly severs or hews a log; the sawyer rips or crosscuts to make every piece fit; the carpenter with hammer and nails fastens parts together with ease and rapidity; the carver finds wood easy to work into artistic designs. Thus every workman who puts tools to wood, from the crudest laborer to the trained artist, finds in it a material satisfactory in nearly every respect.

These qualities have had much to do with the popularity of wood with builders in all ages. The hut of bark, poles, or puncheons, if well roofed and with chinks closed, kept the dwellers as warm and dry as are the occupants of the finest residences of the present time. If those who lived in log houses were not always dry and warm (and they were not always so), it was because they neglected the roofs or permitted too many openings in the walls to remain unchinked and undaubed. The discomforts, if there were any, were not due to the qualities of the wood forming the house, but to the faults of the builder or occupants.

The two qualities most frequently objected to in wood are its combustibility and its susceptibility to decay. Wood will burn and it will decay; but woden houses have stood hundreds of years, thus furnishing proof that buildings need not burn, and that decay may be prevented. Buildings of any material must be cared for if they are to give long service, and those of wood need little more, if any more, care than those of other materials. Wood set in place by the lake dwellers of Switzerland, and by the cliff dwellers of Arizona, and by the unknown builders of some of the buried cities of Central America, is still in place. That is as much as can be said of stone, mortar, metals, shells, bones, and other building materials associated with the wood by the forgotten peoples. Some of the teak and yew door posts excavated from buried palaces of Mesopotamia are in a better state of preservation than is the brickwork that formed the bulk of the buildings. The black walnut and mesquite lintels were found to be the least weather-worn materials in the old Alamo at San Antonio, Texas, when it was restored a few years ago. From the standpoint of durability, no one should ever feel called upon to apologize for wood.

The builders of log cabins seldom knew or cared much about the principles of architecture, but they were resourceful. They were able to build log houses without

THE "OLD JACKSON" MILL

It was built of yellow poplar a hundred years ago; photograph in 1916. The Confederate general, Stonewall Jackson, worked in this mill when a boy and in front of it he mounted his horse to go to West Point to begin his military career. The mill is 150 miles south of Pittsburgh, and it still grinds grain for the farmers.

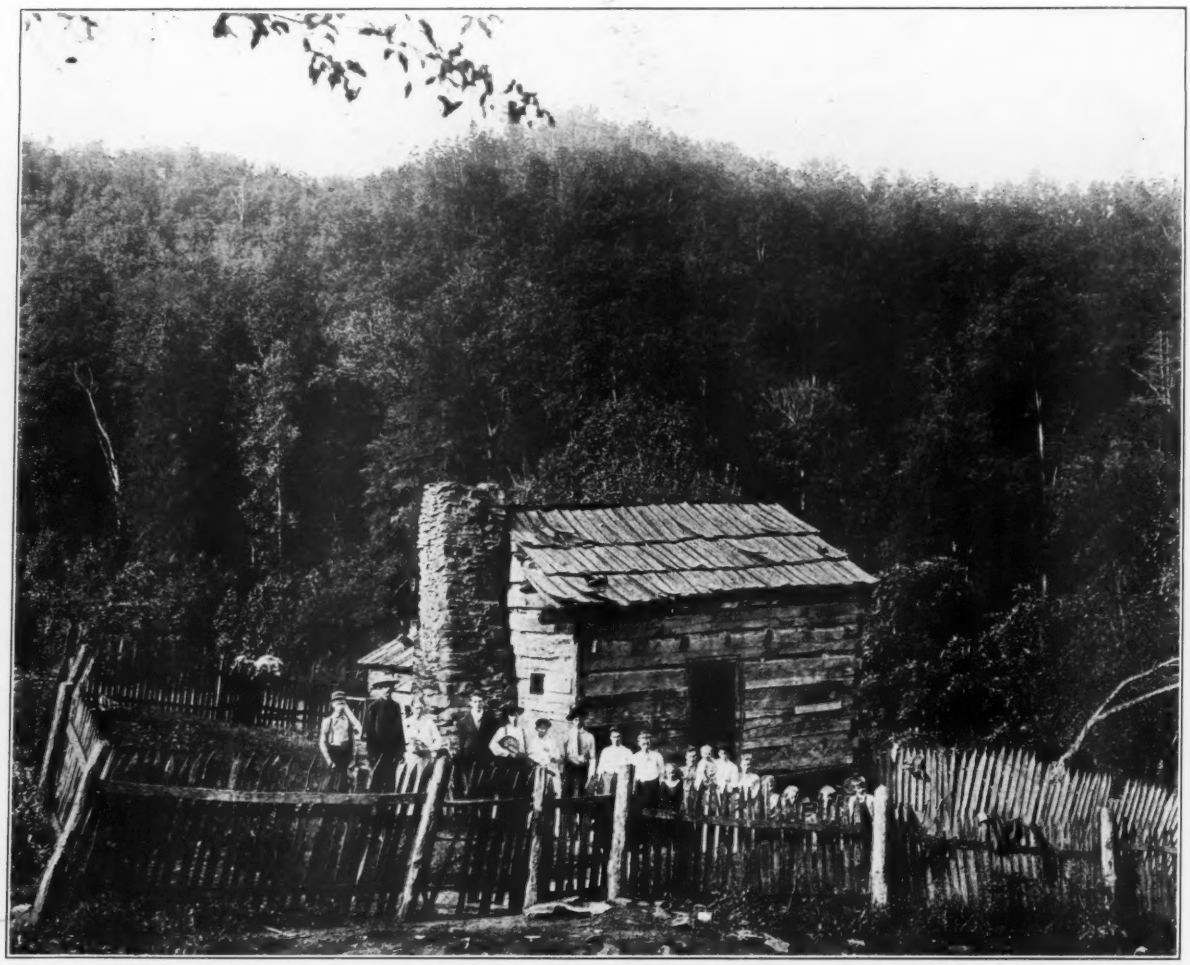
the employment of a nail or other scrap of metal, except the crude tools with which they worked. The roofs were held on by heavy poles placed with such skill that no wind ever unroofed such a cabin, no snow ever pushed the poles off. The door hinges and locks or latches were of wood; wooden pegs were employed in making doors, and were the forerunners of the dowels used by door factories today. The wooden peg was an important

adjunct to the log house in more ways than one. It fastened timbers together. Set firmly in auger holes in the wall, such pins formed the stairway in many a cabin that had a loft; and pins in the walls acted the part of wardrobes, for on them the extra clothes of the family were hung.

The early cabin builder wanted nails above everything else, and he frequently found it impossible to procure them. He was willing to go to extremes in their quest, even at times resorting to questionable methods. The Virginia colonists found it necessary to enact laws to prevent the burning of old houses to recover the nails. In Hening's statutes of Virginia a law is recorded, Volume 1, page 291, providing that when land containing buildings was abandoned, the houses should not be burned for the purpose of recovering the nails, but the owner was "to receive so many nails as may be computed by two indifferent men were expended about the building thereof, for full satisfaction." In 1785 the commandant of Fort Harmar wrote to the governor of Pennsylvania complaining that Kentucky frontiersmen, in order to get nails, had torn to pieces the outbuildings belonging to the fort.

The builders of some of the old Jesuit missions of southern California, about 130 years ago, fastened timbers together with thongs of rawhide for want of nails; and the Mormons at Salt Lake resorted to a similar expedient. Some of those old buildings are standing yet.

The present day builder uses wood more economically than his ancestors used it. Its cost impels him to take that course. The strength of beams is considered, and the loads they can or must carry are taken into account. Pieces larger than are necessary are not employed, nor are pieces used which are so small that they endanger the safety of the structure. Men know more about the limitations of building material than they formerly knew, and this knowledge is put into practice. The expert who understands timber physics is considered essential now, and his advice in matters pertaining to his profession is regarded as a paying investment. Thus there is a saving in the first cost of building material, and a prob-



A HAPPY KENTUCKY FAMILY AT HOME

The size of the family is interesting, but the picture is meant to show a typical two-story log cabin, stone chimney, and clapboard roof, except that the roof boards are not weighted down with poles. The builder evidently economized on window glass and did not patronize the sash and door factory.

able later saving by preventing subsequent failures of the structures. The intelligent builder knows the woods which he proposes using, and he takes their differences into account, particularly their variations in strength, stiffness, hardness, and durability, and by putting each where it will serve best, a high-class building is secured at a moderate cost.

A SHANTY CONSTRUCTED OF RED SPRUCE BARK

This bark roof is held on with poles after the manner of the clapboard roofs of former days on the frontiers. One might suspect that Daniel Boone built this cabin as a hunting lodge, but, in fact, the West Virginia Geological Survey had something to do with it. Such a camp will stand ten years.

Wood in building was not always used so wisely as it is now. Many early houses in the eastern states used too much wood. Some of them were even weakened by the well meant attempts of the builders to make them extra strong. A lavish use of massive timbers, in some cases, increased the weight of the structures until their stability was endangered. Though the limit of safety might not be actually passed, it was quite common to make joists, rafter, sills, and other timbers much larger than necessary. That condition is found in many old buildings yet standing. In addition to employing too much wood, frequently little judgment was shown in the choice of the woods used. A strong one, like oak, might be put in a position where only a small load had to be carried; and, where the strain was severe, a weak wood, like white pine, may have been given a place. At the same time, the employment of large timbers lessened the danger of failure. Some old churches in the eastern part of the country had roof timbers heavy enough for cathedrals. A study of some of those edifices is apt to convey the idea that the builders were very generous with wood; and they could afford to be, for they had plenty of it.

Some of the fire ordinances in cities are intended to restrict the use of wood for building purposes. Experience has demonstrated that when houses are crowded together, fire is likely to gain headway if it makes a start; and wooden buildings catch fire readily from sparks and heat. For that reason, nearly all town and cities have prescribed limits inside of which wooden buildings may not be erected,

A MILL YARD THAT NEEDS CLEANING UP

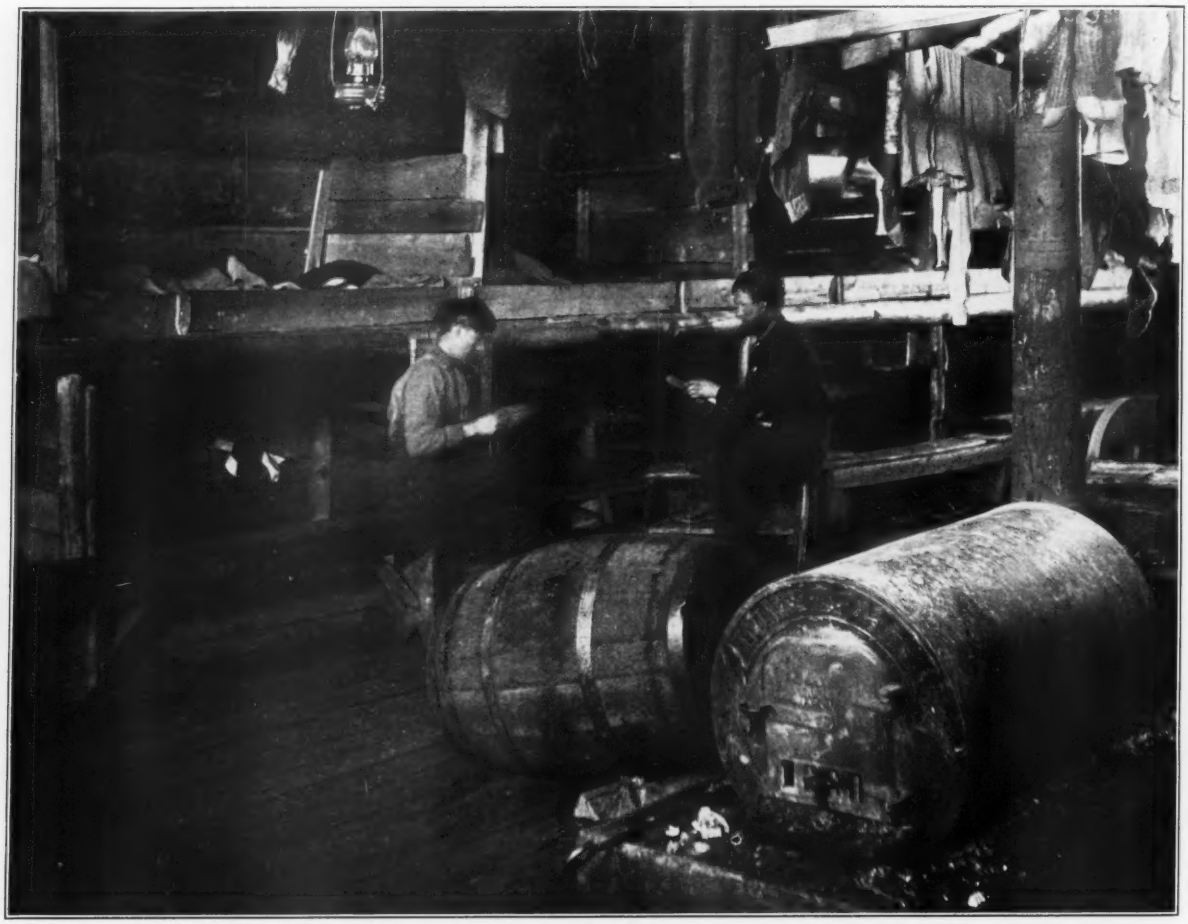
This plant in the Adirondacks is perhaps too busy to spend time at yard cleaning. Material for many a building has come from places like this where logs, lumber, and waste are mingled in about equal proportions, but what has been left behind is worth little in comparison with what has been hauled away to build houses and barns.

but such restrictions do not usually apply in the suburbs, and there wooden houses are found in largest numbers. Many houses with halls of brick or stone are actually more than half wood, the floors, partitions, ceilings, and stairways being of that material.

Without doubt the fire peril is often overworked to the prejudice of wood. Fire laws frequently go too far in restricting the use of lumber in buildings, and persons who may prefer wooden houses are discouraged from building them. The lumber associations of the country are constantly alert to see that municipalities do not knowingly legislate against the proper use of wood in house building. The suspicion is apparently well founded that dealers in building supplies other than wood, but which compete with wood, not infrequently instigate by unfair methods the passage of laws intended to discourage the use of wood.

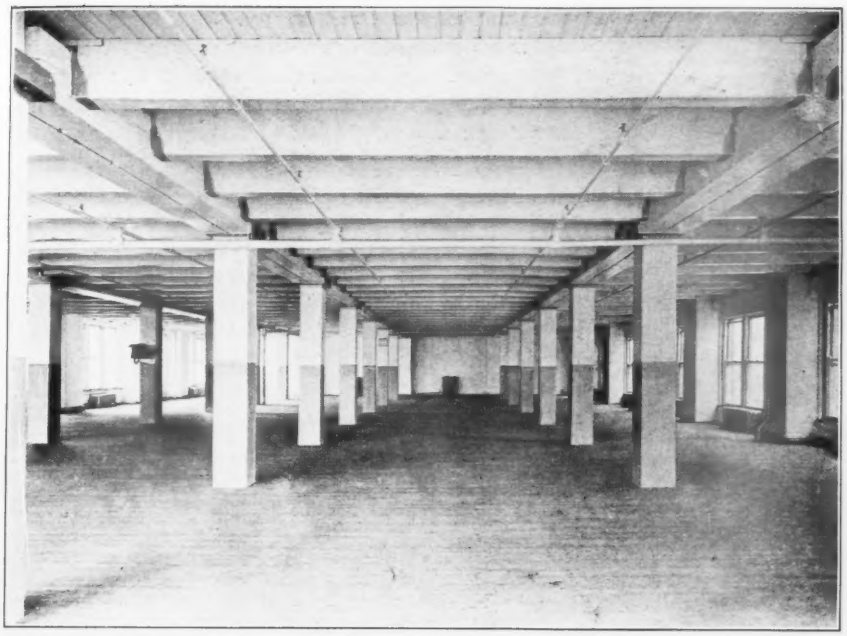
Much has been done to lessen the fire peril in wooden buildings by what is known as the "slow combustion" style of architecture. It is seen oftenest in large warerooms, store houses, and factories. The wood is not made proof against burning, but the corners of exposed timbers are chamfered and the splinters are removed, so that if a fire starts, it will not spread quickly, thus giving the fire fighters a chance to arrive.

Within recent years an important place for the use of wood has been found in a class of buildings designated as "mill construction." The first employment of wood in structures of that kind was not very recent, and it was probably a development from small and crude beginnings; but the style of architecture which now bears that name came into notice quite early in the cotton mills of New England. For that reason it was called mill construction. Buildings of that kind were in existence early in the nineteenth century; but that particular style of architecture did not attract much attention until about eighty-five years ago when the owners of a large number of such mills formed an organization for mutual protection of their property against fire. It resulted in fire insurance, and out of that movement grew certain regulations calling for a standard type of mill building which had proved its value in resisting fire, and also in its strength and permanence. The original regulations concerning such structures are largely em-



THIS IS UNQUESTIONABLY "ROUGH CONSTRUCTION"

Not a stick of this woodwork ever saw a planing mill or a paint brush. Neither would the bunkhouse be a desirable risk for an insurance company. It is an inside view of lumbermen's sleeping quarters and living room in Wisconsin, but is a little out of date, as they have much better layouts now.



EXAMPLE OF HEAVY MILL CONSTRUCTION

The factory shown in the cut affords a good view of the interior of a building of large size where wooden beams and pillars take the place of steel. The structure is very strong, pleasing in appearance, and the fire risk is very low. Photograph by the National Lumber Manufacturers' Association, Chicago.

bodied in modern city building ordinances, though time has developed some improvements and has brought changes.

The mill construction style of building has gained in popularity, and at the present time it is in special favor owing to the extraordinarily high cost of structural steel and the relatively low price of wood. The use of large wooden beams is increasing. They answer all practical purposes as well as steel, within certain limits. The walls of mill construction buildings are of brick. Wood is not necessarily visible on the exterior, but it is employed for floors and their supports, and for the supports of the roofs. Architects have solved the problems of using enough wood to give the requisite strength without occupying too much space or creating dangerous fire conditions. Three general types of mill construction framing are in use and are indorsed in the literature of the National Lumber Manufacturers' Association. Descriptions of the three types follow:

1. Floors of heavy planks laid flat upon large girders which are spaced from 8 to 11 on centers. These girders are supported by wood posts or columns spaced from 16 to 25 feet apart. This type is often referred to as "Standard Mill Construction."

2. Floors of heavy planks laid on edge and supported by girders which are spaced from 12 to 18 feet on centers. These girders are supported by wood posts or columns spaced 16 feet or over apart, depending upon the design of the structure. This type is called "Mill Construction with Laminated Floors."

3. Floors or heavy planks laid flat upon heavy beams which are spaced from 4 to 10 feet apart on centers and supported by girders spaced as far apart as the loading will allow. These girders are carried by wood posts or columns located as far apart as is consistent with the general design of the building. A spacing from 20 to 25 feet is not uncommon for columns in this class of framing when the loading is

EXTERIOR VIEW OF MILL CONSTRUCTION BUILDINGS IN CHICAGO

These rows of modern factories furnish a good example of mill construction as seen from without. Floors, pillars, roofs, and all supports are of wood and the rate of insurance is very low. The walls are of brick and glass. This style of building is now popular. Photograph by the National Lumber Manufacturers' Association.

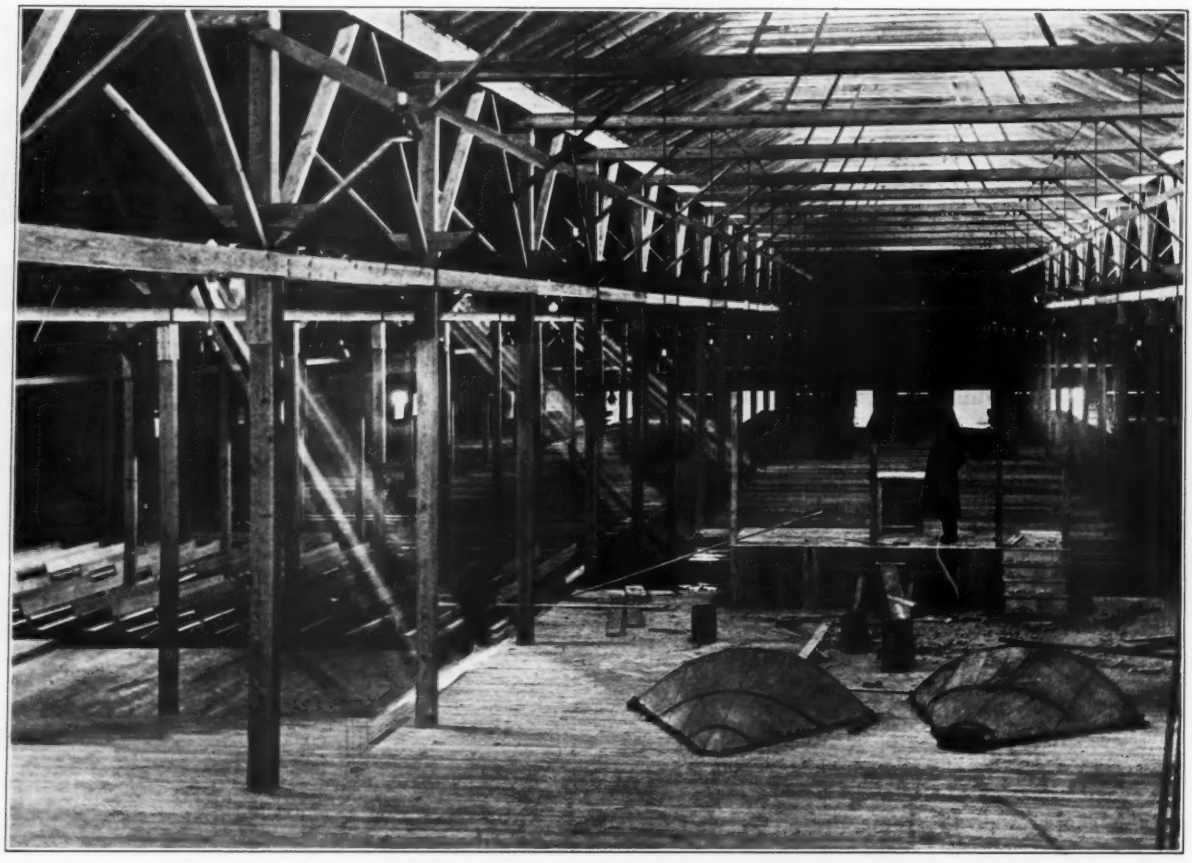
not excessive. This class is more generally known as "Semi-Mill Construction."

Each of these types is provided with a lighter top floor to take the wear and give a finished surface.

Nearly all important cities have large and handsome buildings of this kind, where wood is giving as good service as steel would give and at a much lower cost.

One of the distinctive purposes of mill construction is to obtain strength and stiffness with a minimum amount of timber surface and corners exposed to attack by fire. Large supporting members and flat, smooth, heavy floors provide this requirement. Large timbers do not ignite readily, and if exposed to fire burn slowly and with but a slight penetration after a considerable period of time. Flat, smooth surfaces possess this same strength, usefulness, and beauty. If a fire does occur, the large beams and posts burn slowly and they never collapse until they are burned through. In that particular they are superior to steel beams which heat quickly and then buckle, bringing down in ruins everything above.

The objection to wood because it is susceptible to decay has been overcome to a considerable extent, so far as the use of this material in buildings is concerned. So long as it is kept dry, it will not decay. It is not always possible to keep it dry, but the intelligent builder sees to it that his wood is exposed to the elements no more than is necessary. The knowledge and practice of treating timbers with chemical to hinder or retard rotting have progressed so far that wood exposed to dampness may be made to last a long period. So far as build-



BILLY SUNDAY'S CHICAGO TABERNACLE

The accompanying cut represents the wooden building erected in Chicago for Billy Sunday's meetings. It is said to be the largest wooden structure in the world. 600,000 feet of pine having been used in building it. The edifice is meant to be only temporary, and the lumber was not dressed. The floor has an area of two acres.

resistance to combustion, and may be reached readily with water from sprinklers or hose.

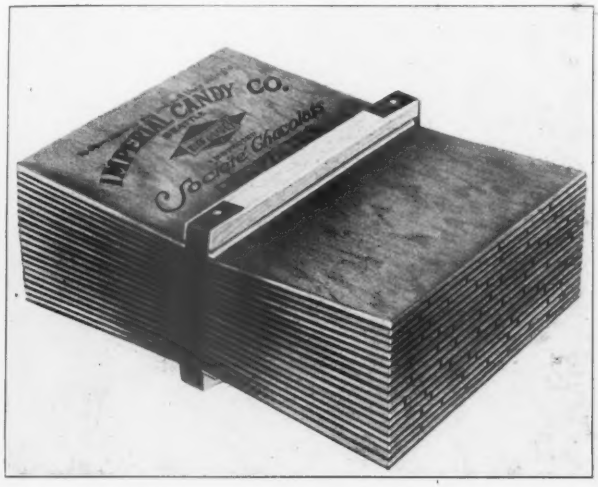
The resistance to fire which woodwork of this kind offers is remarkable. The architect plans to have as few corners and hidden places as possible in which fire can gain a footing and burn where it is out of reach of the fire department. To that end, small timbers are not much used, nor are they in favor. A few large beams and posts take the place of many small ones, lessening the fire peril and detracting nothing from the building's

ings are concerned, the most troublesome decay is that known as dry rot, which does its worst work beneath floors and behind the points of junction of heavy timbers where it cannot be readily discovered. The first visible notice of its presence may be the collapse of a beam or a floor. Good ventilation is the preventive and cure for dry rot. Its name indicates that it is active in dry situations, and the popular notion is that its destructive activity is in some way due to dryness, and that in that characteristic it differs from other kinds of decay which

thrive on dampness. The name of dry rot is misleading, for it must have dampness, the same as other kinds of decay, in order to carry on its work of destruction. Dry rot decay is due to fungus, the same as all other kinds of decay. While this species of fungus prospers in situations which seem to be free from dampness, it needs water and it has the power to get it out of the air by absorbing it, and then makes use of it in producing the decay. This fungus, or one of the dry rot funguses, bears the name *Merulius Lacrymans,* which might be liberally translated into English "tearful" fungus, which name is descriptive and appropriate, for by using its own tears, which it obtains from the dampness of confined air, it produces decay in wood—and the owner of the house has the bills to pay when new floors or new beams have to be put in. Better ventilation drives the damp, stale air away, and the fungus leaves off "weeping," and the wood ceases to rot.

TWO GOOD THINGS IN A SMALL PACKAGE

ANOTHER use has been found for the justly famous Western Red Cedar Shingle. It is serving now as a container for a popular brand of society chocolates. Through the enterprise of the shingle branch of the West Coast Lumbermen's Association, one of the leading candy manufacturers in Seattle has under-



NOVEL CONTAINER FOR A BOX OF SWEETS
This candy box is built of real cedar, made to represent a miniature bundle of Rite Grade inspected shingles.

taken to pack some of his choicest products in miniature shingle boxes made of Red Cedar. The box has every appearance of a regulation bundle of shingles, even to the band stick and label. By a simple manipulation of the band stick the top comes open and a full pound of delicious chocolate candy is disclosed.

Buying candy in red cedar boxes now has become quite a fad among the gallant youths of the Puget Sound country and the novel idea promises to spread to other parts of the country. Thousands of boxes have been sold for parcel post delivery in the East and the candy manufacturers are receiving inquiries from Eastern dealers. One enterprising confectioner in Seattle recently arranged an attractive display window of cedar candy boxes and was rewarded with a group of admiring people in front of his store all day long, many of whom went inside to buy.

In each package is a little card telling something of the shingle industry of Western Washington and Western Oregon. It explains that the brand used on the package "Rite-Grade Inspected" is the official trade marked inspection mark of the Shingle Branch of the West Coast Lumbermen's Association; that its use is jealously safeguarded, and is granted to a mill only when that mill's shingles have been found, by association inspectors, to comply with the grade under which they are manufactured. The little card also informs the purchaser that the cedar industry is a rich asset to the states of Washington and Oregon. More shingles are produced in the state of Washington alone than in all other states combined. An aggregate of 36,000 carloads are taken out of the forests of Washington and Oregon every year. These shingles placed singly, end to end, would belt the earth 66 times with enough left over to stretch to the moon and back.

The shingle industry produces $25,000,000 in annual revenue to these two states.

GENERAL FEDERATION ENDORSES PINE BLISTER LEGISLATION

THE cordial interest of the women of the General Federation of Women's Clubs in the control and suppression of the white pine blister disease, which threatens the extinction of the five-leaved pines of America, is evidenced by the following resolution adopted at the recent convention:

WHEREAS, the white pine blister rust is a destructive disease to native white pine trees; and,

WHEREAS, the disease spreads rapidly and is a menace to the white pine trees of the United States; and,

WHEREAS, the white pine blister rust was introduced into the United States on imported white pine nursery stock; be it

Resolved, That the General Federation of Women's Clubs urge upon Congress the passage of Senate Bill 3344 to prohibit the importation of nursery stock in the United States.

THE PIGEONS AND DOVES

(Family Columbidae)

BY A. A. ALLEN, PH.D.

ASSISTANT PROFESSOR OF ORNITHOLOGY, CORNELL UNIVERSITY

IN these days of world strife, nothing could be less appropriate than a story about doves. The emblem of peace and gentleness finds but scant welcome while forests are devastated while cathedrals smoulder, and while women and children are slaughtered through the barbarism of a so-called civilized nation. From another point of view, however, a few paragraphs upon real doves might be quite timely because, during the past two years, so many vultures have taken flight from German soil in the guise of doves of peace. But this is not an article upon doves of peace, nor German doves, but upon the doves of United States and Canada, and though the American dove will eventfully follow the eagle across the sea, it is not the purpose of these paragraphs to trace its flight.

To begin with, there is no real difference between doves and pigeons. The word dove is ordinarily applied to the smaller species but often the two terms are used interchangeably. — Thus the bird from which our domestic pigeon has been derived is most generally called the blue rock pigeon or the rock dove.

THE EMBLEM OF PEACE AND GENTLENESS

This shows a mourning dove at its nest. The members of the family have many distinctive characteristics of form and plumage. Indeed the Hohenzollerns are having difficulty in disguising the Prussian Eagle in the plumage of a dove. The feathers are too short to conceal its form.

In general, pigeons and doves can be distinguished from other birds by their small heads, heavy bodies and compact plumage. They have slender bills which are swollen at the tip and covered at the base by a soft fleshy skin called a cere. Their wings are long and pointed but their legs are relatively short so that while they are extremely strong fliers, they walk with short mincing steps. Their tails are always well developed and may be either square, rounded or pointed. Some confine the name pigeon to the square-tailed birds and the name dove to those with rounded or pointed tails but this is by no means universal, the passenger pigeon, for example, having a decidedly pointed tail.

There are about 650 species of pigeons and they are found in all parts of the world except Arctic and Antarctic regions, being most abundant in the tropics, especially in the region of the Malay archipelago, where possibly they may have originated.

Because of their defenselessness, pigeons are particular adapted to island life where enemies are few. This may account for their great abundance in the Polynesian Islands and also for the brilliant and conspicuous plumage of those species. For, while the majority of continental species are bluish or brownish, many of these island species are strikingly brilliant and varied in their plumage, reds, greens and purples occurring in wonderful combination.

Isolation likewise accounts for such anomalous pigeons as the extinct dodo and solitaire of Mauritius and Rodriguez. These curious, heavy - bodied birds had entirely lost the power of flight because of the absence of terrestrial enemies on the islands which they inhabited. This made them an easy prey for the first explorers that found them, causing their early extermination.

In size, pigeons vary from the tiny ground doves, some of which are smaller than sparrows, to the crowned pigeons which measure from two to nearly three feet in length, or the aforementioned dodo which was described by its discoverers as "bigger than our swans."

Pigeons vary greatly in habits, and in the choice of their haunts. Some species live in large flocks, while others are solitary; some inhabit the dense forests, others the open plains; some are terrestrial and rarely fly while

others are arboreal and among the strongest fliers. Most species disband during the nesting season, but the passenger pigeon nested in colonies of immense size.

Pigeons' nests are crude affairs, with little shape, built of sticks, and without lining. The eggs are pure white and usually two in number. The young are naked when hatched and perfectly helpless. They are fed by regurgitation during the entire time they are in the nest and indeed until they learn to eat by themselves. The food of the parents consists largely of seeds or grain which is stored in an extremely large, two-lobed crop and there softened and partially digested. This curdlike mass, mixed with a secretion from the wall of the crop, called "pigeons' milk," is injected into the throat of the young bird.

The writer once tried to raise a young mourning dove which was partially crippled and deserted by its parents. All methods of feeding were unsuccessful, since the bird refused to swallow, until by chance, I happened to press on the corners of the mouth when food had been placed in the bird's throat. This was like pressing the magic button for the muscles of the throat immediately began to work and the food was swallowed. It seems nature has taken this method of conserving food and not until the old bird grasps the corners of the mouth of the young in its bill is it able to swallow, and the old bird, knowing this, does not disgorge the food until it has the right hold. Thus no food is spilled or wasted.

THERE IS NO PLACE LIKE HOME

But young doves are not pampered with unnecessary comforts. A crude platform of sticks suffices for them. Here the mother dove is brooding her youngsters.

The amount of food which a young dove is given at one feeding is often startling. Its crop is just as well developed as the old bird's and will hold several spoonfuls of seed, so that after each feeding the contour of the young bird's neck changes decidedly. Naturally the young are fed much less frequently than most young.

In drinking, pigeons differ from other birds in that they do not raise the head in order to swallow but keep the bill immersed until the draught is finished.

Pigeons have been variously grouped by ornithologists into families and sub-families but, in general, five large groups are recognized. There are first, the fruit pigeons, of which there are 212 species. They are the most brilliantly colored and are largely confined to the Malayan region. The bleeding heart pigeon, a familiar aviary species, is a typical member of this group but is by no means the most brilliant.

The second group, the true pigeons, number about 120 species and they are found throughout the world. The rock dove and the stock dove of Europe, and the passenger and band-tailed pigeons of North America are typical examples.

The third group contains the ground doves of which there are 312 species. They, likewise, are cosmopolitan but they are most abundant in the tropics. They have shorter toes and somewhat longer legs than the true pigeons and spend most of their lives on the ground. The mourning doves of North America and the turtle doves of Europe belong to this group, but they are more similar to the true pigeons than are the majority of their kin.

The crowned pigeons, numbering eight or nine species, are confined to New Guinea, and form the fourth group. They are handsome slaty-blue birds, and are the largest of all living pigeons, varying from two to nearly three feet in length. The head is adorned with a large compressed crest, which with the large size of the birds gives them quite an unpigeonlike appearance. In fact one might almost think they belonged with the pheasants or the peacocks.

The last group or toothed pigeons contains but a single species, the so-called red bird of Samoa which has been almost exterminated by the introduction of the domestic cat. Its bill is quite different from other pigeons, being somewhat hooked and notched or toothed toward the tip. A real tooth is, of course, not present.

Of the true pigeons, the domestic variety is naturally the best known. The parent species is the rock dove

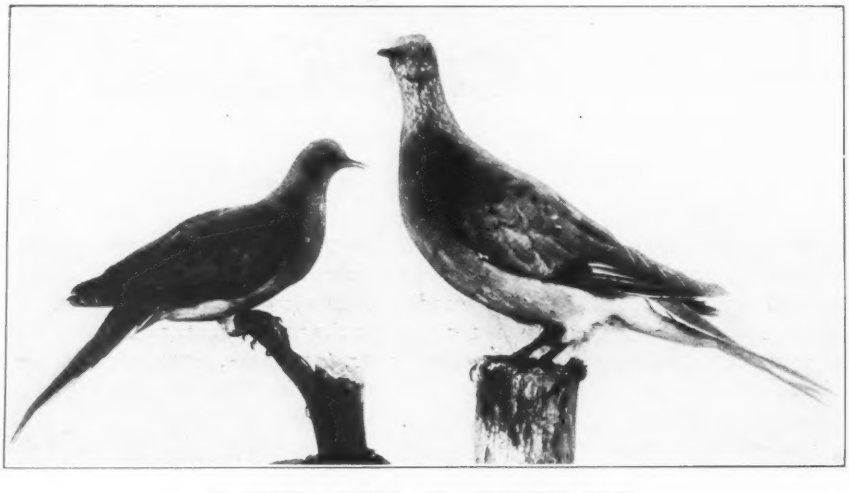
which in the wild state, inhabits the rocky coasts of Europe from the Faeroes to the Cyclades, nesting in caverns. In the domestic state, it has been carried to all parts of the world and more than 150 different kinds, which breed true, are now recognized by fanciers. In the United States, the only surviving species of true pigeon is the band-tailed pigeon of the Rocky Mountain region and it is becoming rare in many places. It is a bird nearly the size of the domestic pigeon and somewhat the same color, but with a white band on the back of the neck and a light gray band on the end of the tail. It feeds largely upon acorns, young sycamore balls and wild berries and normally confines itself to the mountains although it sometimes frequents larger river bottoms in large flocks if food is found to be good and abundant.

AN UNUSUAL NESTING SITE

The mourning dove usually nests on the lower branch of a tree but here its nest is placed on a fallen limb in a marsh. All doves lay two white eggs.

If we omit the white-crowned pigeon of the Florida Keys and the West Indies, the only other true pigeon indigenous to the United States and Canada is the Passenger pigeon, but it is now extinct. The vast flocks which during the last century darkened the sky for hours or even days at a time, are no more. The last survivor of the whole race died in the Cincinnati zoological park, September 1, 1914. Reward of several thousands of dollars have since failed to bring to light a single living specimen of this splendid bird. Alexander Wilson, writing about 1808 estimated that a flock observed by him near Frankfort, Kentucky, contained over two billion indiduals and a nesting colony near Shelbyville in the same State extended through the woods for nearly forty miles and was several miles in width, every tree of suitable size being loaded down with nests, the larger trees containing from ten to forty. Their nocturnal roosts, at other seasons of the year, were nearly as impressive. Nuttal in describing them states: "Nothing can exceed the waste and desolation of the nocturnal resorts; the vegetation becomes buried by their excrement to the depth of several inches. The tall trees for thousands of acres are completely killed, and the ground completely strewed with massive branches torn down by the clustering weight of the birds which have rested upon them. The whole region for several years presents a continued scene of devastation, as if swept by the resistless blast of a whirlwind." The last wild birds of which we have any definite record were shot in 1898, curiously enough both on the same day, September 14, though one was killed in Michigan and one in New York.

During the ninety years from the time Wilson wrote until the species disappeared, the birds were netted and shot by the thousands and shipped in carloads or even train loads to the markets or fed to the hogs. Not content with netting and shooting the market hunters went to the nesting grounds with clubs and fires and sulphur pots and killed the birds on their nests. At one nesting place in Michigan, 500 netters were at work and their average catch was 200,000 birds apiece



PASSENGER PIGEON AND MOURNING DOVE

When the two birds are side by side the difference in size is very apparent. The pigeon is now entirely extinct; the last survivor of the once abundant species died in the Cincinnati Zoological Park September 1, 1914.

and at another it was estimated that fully a billion birds were accounted for. The laws at that time, gave them no protection because, as stated in some of them, it was considered that they were so numerous that the inroads of man could have no appreciable effect upon their numbers. And now they are gone. The last nesting known in New York State occurred near Olean in 1868, in Michigan in 1881. What a pity that even a few of these splendid birds could not have been spared, and raised in captivity if necessary, that we of the present might better appreciate the wonderful phenomenon witnessed by our fathers. Perhaps, however, we may learn from the mistakes of our fathers and, though we have lost this species, we may yet save others that are following it to extinction.

The mourning dove, though it is put in a different family or sub-family, is like a small edition of the passenger pigeon. Indeed when the rewards were offered for the discovery of a passenger pigeon, numerous claims for it were made by unobservant persons who had discovered mourning doves. Indeed the general shape and color pattern are very similar and differences of size are very difficult to judge in the field. The male passenger pigeon is very much bluer on the back and wings and redder on the breast than the mourning dove, but the female pigeon is scarcely brighter than the male dove. A close examination will always distinguish the mourning dove because it has a narrow black mark below and behind the eye and its belly and undertail coverts are buffy instead of white.

PHOTOGRAPHING THE MOURNING DOVE

The camera is concealed in the gray box raised on a 15 foot tripod of poles. The box was in place several days before the picture was taken and gradually moved closer so that the dove became accustomed to it.

Mourning doves are found throughout the United States and southern Canada from remote deserts to orchards and gardens, but seldom in the deep woods. They usually travel in pairs or small flocks and never nest in colonies as did the passenger pigeon. For this reason they will never meet its fate and while they have become rare in some localities because of excessive shooting, they have now been taken from the game list in most states and are gradually increasing. They are extremely rapid on the wing, cutting the air like bullets, and it is little wonder that they are so widely distributed. They sometimes nest miles from water, and night and morning fly in pairs or small flocks to drink. In fact, old mountaineers in Arizona sometimes follow their flight in order to discover the water holes. During the breeding season, they indulge in curious courtship evolutions, circling with unnatural short beats of the wings and sailing over the nesting area so that they appear strangely like sharpshinned hawks.

Like all other members of the family, mourning doves build crude platforms of twigs without lining of any sort on which to lay their two white eggs. These are usually on the lower branches of a tree but occasionally they build directly on the ground or on a stump or log fallen in a marsh. They begin nesting early in April in the northern States and raise two or three broods, nests containing fresh eggs being not unusual in late August.

The notes of most wild pigeons are soft cooing sounds and those of the mourning dove are even more gentle and mournful than others. This has given rise to its name.

The turtle dove, a species that is often seen in captivity in this country, is native throughout Europe during the summer, retiring to northern Africa for the winter. It is quite similar to our mourning dove, being fawn color with a larger black mark on the sides of the neck.

The rest of the ground doves are mostly tropical though one species is not uncommon from Florida to North Carolina. It frequents all sorts of situations from the swamps and pine barrens to the quieter streets of the cities and often comes to feeding stations maintained for birds. It is not much larger than a sparrow and a trifle darker and browner than the mourning dove. It nests on the ground or in a low tree or bush and lays small white eggs. Many of the tropical ground doves are larger and dwell on the ground in the dense forest where they are found only with difficulty. Indeed they are not unlike tinamous in the way they slip through the underbrush and disappear.

A very interesting fact in connection with the growth of the features of members of the pigeon family has recently been pointed out by C. W. Beebe in the appearance of a row of enlarged stiff feathers along the inner margin of the thigh, that are among the first to appear.

These feathers, Mr. Beebe believes, are indicative of a former stage in the development of flying birds from their reptilian ancestors. Before the wings had come to their present perfection and when the tail was still long and heavy, it was necessary to have more support at the rear end of the body to serve the same purpose as does the membrance between the hind legs of a bat. These stiffened thigh feathers are thought to have served this purpose and today, though they are no longer needed and though they have degenerated to nearly normal proportons, they have not yet entirely disappeared.

Photograph by G. T. K. Norton

AN INSPIRING SIGHT IN THESE DAYS OF NATIONAL STRESS

THE Capitol dome from the Congressional Library. The most impressive trees were "focused out" so that the picture might be made. An idea of the number and size of the trees in Washington is best shown by the fact that it takes much time to photograph almost any subject from any distance.

SPECIAL PRIVILEGE TO THE MILITARY

THE large concentration of men at Camp Dix in New Jersey, which is located on the edge of one of the worst wilderness sections of the South Jersey pines, presented an unusual problem from the forest fire standpoint. By an understanding with the authorities in command special emphasis is being laid upon the need for care with fire when the men in training at the Camp have occasion to go into the wooded sections for either recreation or official work. The Department has made a blanket waiver of the necessity for securing permits for building fires to all military parties who are out on official duty in the various sections adjoining the cantonment.

ITALY'S NEED FOR WOOD

ITALY will need unusual quantities of American lumber after the war. Authorities estimate that in the first five years of peace that nation must import from three to five times as much as it imported per year in the pre-war period, and for the ten years succeeding these five years, about double the annual pre-war imports. In other words, Italy will require for the first five years, 3,000,000,000 to 5,000,000,000 board feet of rough and square lumber per year, and 2,000,000,000 per year for ten years following this period. The longer the war is prolonged the greater will be the demand, and another factor will be the price at which lumber can be laid down in Italian ports.

Temporary construction for war purposes has required great quantities of lumber in Italy, while the difficulties attending the importation of lumber and the lack of coal within the counry have made it necessary to use enormous amounts of wood for fuel.

State forestry began in Italy about 1877, the country being almost forestless until the state took hold. From forests and wood lots existing at the beginning of the war, it is estimated that approximately 50 per cent of all standing timber has been cut to date.

Before the war except for small quantities of black walnut from the United States and a little cabinet wood, all the imports were of cheap commercial lumber, coming mostly from Austria-Hungary and the United States. The chief source of supply was Austria-Hungary, but since the war none has been secured from that source.

The building situation in Italy has been peculiar for centuries. Scarcity of lumber for hundreds of years has brought about methods of construction in which a minimum of lumber is used.

Beds of excellent clay suitable for brick and tile making, good building stone and limestone capable of yielding fine qualities of lime and cement are found in almost every part of Italy. Added to this a surplus of labor before the war kept wages at a point that made stone and brick construction possible at prices that would seem incredibly low in new countries. Wooden houses are more common along the northern frontier of Italy, in districts near the forests of Switzerland and Austria-Hungary, where wood is plentiful and comparitively cheap.

WE have much pleasure in announcing the fact that Major W. B. Greeley, who is attached to the Forestry Section of the Engineer Corps and has been handling very important work in France, has recently been assigned to a high staff position with the rank of Lieutenant-Colonel.

FLOWER AND OTHER STUDIES FOR THE SUMMER OF 1918

BY R. W. SHUFELDT, M. D., R. A. O. U., ETC.

MAJOR, MEDICAL CORPS, U. S. ARMY

IN THE issue of AMERICAN FORESTRY for last month considerable attention was paid to the Spiderwort (Fig. 1) and to the edible mushroom known as the delicious morel (*Morchella deliciosa,* Fig. 2). Cuts were made of these interesting species; but owing to lack of space accommodations, they were both crowded out. They are reproduced here in that their histories may be made more complete through placing them on record—taken in connection with what was published about them in the June number.

During the latter part of that month, and in some regions throughout the rest of the summer well up into the autumn, we meet with a genus of flowers of which there are about a dozen species in the United States, mostly east of the Mississippi River. Reference is made to the Skull-cap of the genus *Scutellaria,* both names being decidedly fanciful; for surely the beautiful flowers of no one of the species in the remotest degree remind us of such a thing as a "skull-cap," any more than the fruiting calyx suggests a "little dish" (Fig. 3), which is the meaning of the Latin name *scutella.* This name apparently came about from the fact that the peculiarly formed appendage on the superior lip of the calyx opens on pressure and thus exposes the four little seeds in the cavity. This the children have likened to a little dish; and even Linnæus who created the genus seems to have been influenced by the same suggestion when he named it *Scutellaria.* Our vernacular names are equally ridiculous, for one of the best known species of this Mint family (*Labiatae*), the *Scutellaria lateriflora,* has not only been called Helmet-flower and Hoodwort, but also Mad-weed and Mad Dog Skull-cap,—appellations handed down to us by the old herb doctors, who held that they could cure hydrophobia through its use. One of the most abundant Helmet-flowers is the *Scutellaria lateriflora,* which is usually found growing in damp and wet places in the woods in almost any part of this country, and in not a few localities in the British possessions north of us. It is more abundant in some regions than in others, while in the case of other large areas it is not found at all.

The general form of the flowers of the helmet-flower genus is well shown in Figure 3, which is one of the species that possesses serrated leaves. *S. lateriflora* has flowers that are usually blue, though in rare instances they may be pink, or pink running to white and even pure white. Generically, Gray characterizes the genus *Scutellaria* thus: "Calyx bell-shaped in flower, splitting to the base at maturity, the lips entire, the upper usually falling away. Corolla with an elongated curved ascending tube, dilated at the throat; the upper lip entire or barely notched, the lateral lobes mostly connected with the upper rather than the lower lip; the lower lobe or lip spreading and convex, notched at the apex." This much we can easily see in Figure 3, and Gray further informs us that they are "bitter perennial herbs, not aromatic, the short peduncles or pedicels chiefly opposite, 1-flowered, often 1-sided, axillary or spiked or racemed;" they flower all summer long.

NO PLANT OF SPRING AND SUMMER IS MORE ATTRACTIVE THAN THE SPIDERWORT OF THE ATLANTIC STATES

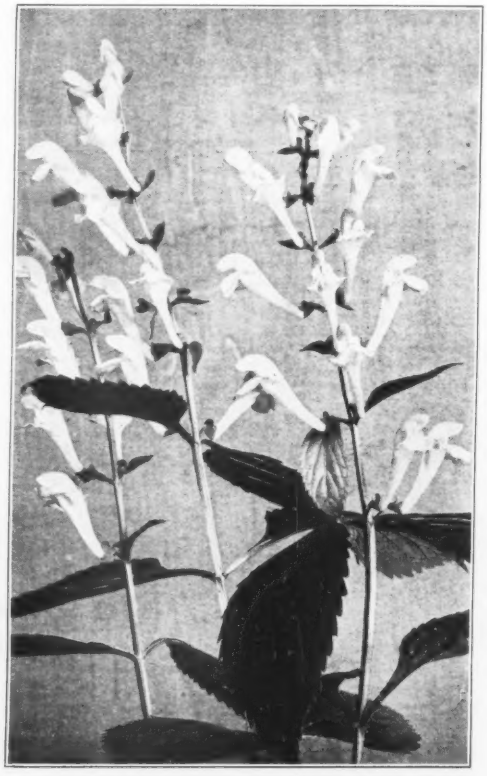
Fig. 1—In the flora of the eastern United States we find two genera of plants in the Spiderwort family (*Commelinacae*); there are many species of the Spiderwort genus (*Tradescantia*), while the second group contains the Dayflowers (*Commelina*), of which there are several kinds.

S. serrata (Fig. 3) has been called the Showy Skull-cap for the reason that its flowers are so beautiful and striking. Other species are the Hairy Skull-cap, the Larger or Hyssop Skull-cap, and the Marsh Skull-cap (*S. galericulata*). Gray describes about thirteen species

and one subspecies of skull-caps for the Central and North-eastern sections of the United States alone.

Many flowers are more or less related to these skull-caps, as Gill-over-the-ground (*Nepeta hederacea*); also the Dragon-head (*Dracocephalum*), and our Self-heal (*Prunella*); some of the nettles, Pennyroyal, Bugle-weed, and others. It is an interesting group, the *Labiatae,* and many of them have already been figured in these articles in AMERICAN FORESTRY.

We may now pass to the consideration of another group of flowers, represented by species of great beauty, which has made them friends and favorites wherever they are found. These are the famous Lady-slippers or Moccasin flowers of the genus *Cypripedium* (*Cypripedieae*) that fall into the lovely Orchis family (*Orchidaceae*). So well do Figures 4 to 10 inclusive of our illustrations here present the form, leaves, and general character of our Lady-slippers, that no special descriptions are needed. Our northeastern flora contains quite a number of these conspicuous plants with their showy flowers; but it may be as well to note here, however, that the flowers are either very few on a stem, and generally solitary or single in all the species. Usually the stems are more or less hairy or pubescent, and the roots fibrous and coarse. The leaves can be easily studied in the figures, where, too, other structures are well presented.



OLD-TIME HERB DOCTORS CONTENDED THAT IT WOULD CURE HYDROPHOBIA. HENCE IT RECEIVED SUCH NAMES AS "MAD DOG SKULL CAP" AND "MADWEED"

Fig. 3—Besides the above names, however, it is also widely known as the "Helmet flower" and "Hoodwort." It really belongs to the Mint family (*Labiatae*), and botanists know the common species as *Scutella laterifolia;* the one shown is probably *S. serrata.*

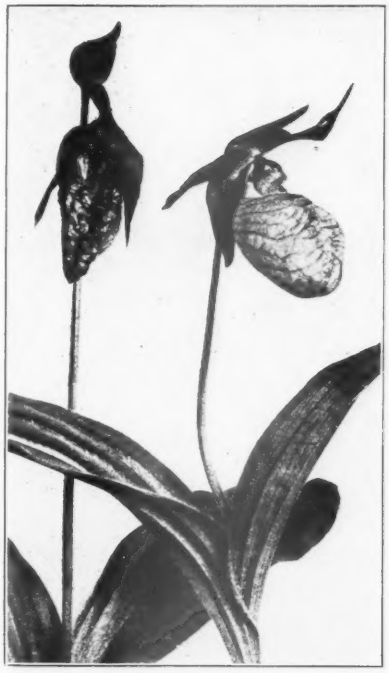
Throughout the northeastern section of the United States we meet with some seven or eight different species of the Lady-slippers, and among them the remarkable looking Ram's Head Lady-slipper, which is a very rare and local species found in swamps and rich woods (*C. arietinum*). Passing this species, we have two kinds of these plants that have *yellow* flowers, namely the Smaller Yellow Lady-slipper (*C parviflorum*) and the Larger Yellow, which is a lover of the woods and forests, and which many botanists consider to be but a variety of *C. pubescens.* Then there is another in which the lip is *white* (*C. candidum*), and which is rather rare. It is found in swampy places throughout many regions in the northeastern sections, especially in New York, New Jersey, to southern Minnesota, and down through Kentucky and Missouri. We should be careful to not confuse this species with the albino form of the Pink or Stemless Lady-slipper (*C. acaule,* Fig. 10).

The Showy Lady-slipper is also a superb species (*C. hirsutum*), as is *C. passerinum,* in which two species the sepals and petals are not twisted; they may either nearly equal the lip or be shorter than it. There are probably other species in other sections of the United States, especially in the South and West. All of our Lady-slippers have a wonderful structure, and the genus has interested botanists all over the world. Most of them are easily naturalized, and they may all be transplanted to our gardens, where, without any special care, they will flourish beautifully.

Speaking of the Large Yellow Lady-slipper, or Yellow Moccasin Flower, also called the Whippoorwill's Shoe, Neltje Blanchan writes of it in this interesting vein: "Swinging outward from a leaf-clasped stem, this orchid attracts us by its flaunted beauty and decorative form from tip to root, not less than the aesthetic little bees for which its adornment and mechanism are so marvellously adapted. Doubtless the heavy oily odor is an additional attraction to them. Parallel purplish lines, converging toward the circular opening of the pale yellow, inflated pouch, guide the visitor into a spacious banquet hall (labellum), such

PECULIAR-LOOKING BUT EDIBLE MUSHROOMS

Fig. 2—This is *Morchella deliciosa,* thus named on account of being considered one of the most delicious of all edible mushrooms. Its average form is well shown here, and it is found early in the season in Maryland and elsewhere; its common name is the delicious morel.



THE SEVERAL SPECIES OF THE MOCCASIN FLOWER OR LADY-SLIPPER ARE ALL VERY CONSPICUOUS REPRESENTATIVES OF THE ORCHIS FAMILY (*Orchidaceae*).

Fig. 4—This flower is the stemless Lady-Slipper (*Cypripedium acaule*) of Gray, by many called the Pink Lady-Slipper on account of the lively pink color of its lip. Here we see the full flower contrasted with the wilted one (as the seed-pod or ovary forms). The ovary is in plain sight.

as the pink lady's slipper also entertains her guests in. Fine hairs within secrete tiny drops of fluid at their tips—a secretion which hardens into a brittle crust, like a syrup's, when it dries. Darwin became especially interested in this flower through a delightful correspondence with Professor Asa Gray, who was the first to understand it, and he finally secured a specimen to experiment on."

Darwin's description of the fertilization of the Lady-slipper is a truly wonderful story in botany, and it is to be much regretted that it is too long to reproduce in this place, while to abbreviate it would be a great shame; it would surely spoil the lesson it carries.

The solitary flowers of the Pink Lady-slipper or Moccasin Flower are delightfully fragrant, and it is a pleasure to meet with the plant in the deep woods where it grows among the great rocky boulders; in fact, it is a pleasure that remains with one for a lifetime. Unfortunately, our Pink Lady-slipper is becoming extremely rare over large areas where it was formerly very abundant. This is due to thoughtless and uninstructed picnickers and joy-riders, who leave their machines to ramble far and wide through the woods where formerly the moccasin flowers grew in numbers. Many of these people cannot forbear picking every pretty flower they can reach, and our beautiful pink lady-slipper, for very obvious reasons, is one that is most often so destroyed. In scores of localities where it once grew plentifully, *Cypripedium acaule* is now no longer to be found.

Popular writers on our flowers seem to have vied with each other in their

WE HAVE A SMALLER AS WELL AS A LARGER YELLOW LADY-SLIPPER; THE SPECIES HERE SHOWN IS THE LATTER (*C. pubescens*).

Fig. 6—A related species is known as the Ram's Head Lady-slipper (*C. arietinum*), and for a very obvious reason.

fanciful descriptions of these extraordinary plants. Elaine Goodale wrote of the Pink Moccasin Flower:

"Graceful and tall the slender, drooping stem,
With two broad leaves below,
Shapely the flower so lightly poised between,
And warm her rosy glow."

Long ago Darwin pointed out that cross-fertilization results in offspring which vanquish the offspring of self-fertilization in the struggle for existence, which is distinctly true of these Lady-slippers; for of all others they are, through their peculiar structure, more than protected against the evils of self-fertilization. Through the ages they have finally acquired a structure, in so far as the flower is concerned, that makes self-pollination an almost impossible occurrence.

In this connection one of our most popular writers on flowers says that the "fissure down the front of the pink lady-slipper [see cuts illustrating this article] is not so wide but that a bee must use some force to push against its elastic sloping sides, and enter the large banquet chamber where he finds generous entertainment secreted among the fine white hairs in the upper part. Presently he has feasted enough. Now one can hear him buzzing about inside, trying to find a way out of the trap. Toward the two little gleams of light through apertures at the end of a passage beyond the nectary hairs, he at length finds his way. Narrower and narrower grows the passage, until it would seem as if he

THIS IS A MOST PERFECT SPECIMEN OF THE PINK MOCCASIN FLOWER IN FULL BLOOM.

Fig. 5—Note the venation on the great, inflated, pink lip, and the curious arrangement of the structures back of it.

could never struggle through; nor can he until his back has rubbed along the sticky overhanging stigma, which is furnished with minute, rigid, sharply pointed papillæ, all directed forward and placed there for the express purpose of combing out the pollen he has brought from another flower on his back or head. The imported pollen having been safely removed, he still has to struggle on

IN THE CASE OF THE LARGER YELLOW LADY-SLIPPER, WE OCCASIONALLY MEET WITH A PLANT WHERE TWO FLOWERS OCCUR ON ONE STEM

Fig. 7—Note the upper one of the twin flowers; it shows very well that, in the passing of the bloom, the withering begins at the toe of the "slipper."

toward freedom through one of the narrow openings, where an anther almost blocks his way.

"As he works outward, this anther, drawn downward on its hinge, plasters his back with yellow granular pollen as a parting gift, and away he flies to another lady-slipper, to have it combed out by the sticky stigma as described above. The smallest bees can squeeze through the passage without paying toll. To those of the Andrena and Halictus tribe the flower is evidently best adapted. Sometimes the largest bumblebees, either unable or unwilling to get out by the legitimate route, bite their way to liberty. Mutilated sacs are not uncommon. But when unable to get out by fair means, and too bewildered to escape by foul, the large bee must sometimes perish miserably in his gorgeous prison."

In his book entitled, "My Studio Neighbors," William Hamilton Gibson has likewise given us a most interesting account of the fertilization of the Pink Lady-slipper by bumblebees; it is well worth looking up and reading.

F. Schuyler Mathews says of the Showy Lady-slipper that "This is perhaps the most beautiful plant of the whole genus. The stem is stout and leafy to the top, the flower fragrant; its point is white, more or less blotched or stained with velvety light crimson-magenta, the sepals and petals white, broad, and not longer than the rotund pouch. The sterile stamen, long-heart-shaped, stained yellow at the tip and spotted crimson, crowns the column." His colored cut of the flower and leaves is rather attractive, and gives us a fairly good idea of the original.

One of the quaintest remarks made about the Yellow Lady-slipper comes from the pen of Alice Lounsberry. She says: "The color of this orchis is above all enchanting, while the coyness of its shape and the twirling side strings breathe out the essence of coquetry. There is an alertness, a crispness of expression about the out-turned toe which makes us fancy it is only awaiting the waving of some fairy's wand to spring out with its companions and mingle in a gay woodland dance."

AS PROFESSOR GRAY TELLS US, THE LEAF OF THE YELLOW LADY-SLIPPER IS MANY-NERVED AND PLAITED, SHEATHING AT THE BASE

Fig. 9—This gives the enlarged ovaries of the Yellow Lady-slipper (*C. pubescens*), two on one stem and one on the other. The insect is one of the "true bugs" (*Coreidae*).

What imagination some people do possess! Her figure of the flower is something after the order of the one here reproduced in Figure 8, only hers is colored. But it would seem that there must be many people still left in the world who can complacently gaze upon that picture without having such fantastic thoughts arise in their minds.

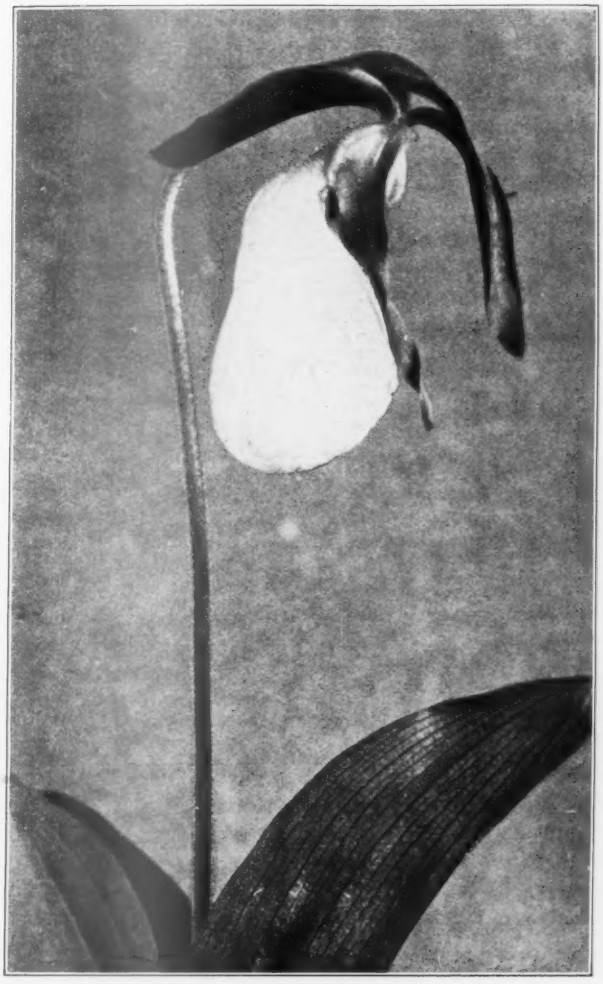
When the Pink Lady-slipper is found in very swampy land, where it often flourishes most vigorously, specimens of its flowers may be secured which are bleached nearly white from the excessive moisture of its surroundings.

Mr. Baldwin, quoting a lady who is familiar with this species in the Adirondacks, was informed by her that "it seems to have a great fondness for decaying wood, and I have often seen a whole row perched like birds along a crumbling log." They have also been found growing among the crags high up on the mountain sides, and in such situations, further north, spring up among the reindeer moss.

For several months past it has been the custom to select a zoological picture for the current flower article of the issue of AMERICAN FORESTRY. In no instance has the subject so chosen had any special connection with the main feature of the contribution in which it has appeared —although it might have. Often they have been animal forms that the collectors of flowers afield are likely to meet with on their excursions for specimens, and so they have, in this way, been useful and instructive. Many of the subjects have been well spoken of by readers of AMERICAN FORESTRY; and it has had the advantage of using material brought in, which might otherwise meet no useful purpose. Our subject for this issue is an immature specimen of the well-known Red-tailed Hawk (*Buteo b. borealis*), a falconine species occurring in the greater part of eastern North America. This elegant hawk, when adult, has a tail of a bright rust-red, while in the subadult it is grayish, and banded across with some seven or eight narrow bars of blackish. The red tail of the parent bird is responsible for its vernacular name; however, it also has received other names, as the Hen Hawk, Chicken Hawk, White-breasted Chicken Hawk, Red-tailed Buzzard, Red Hawk, Buzzard Hawk, and Eastern Red-tail. Such a confusion of names would certainly put any one at sea in the matter of the identification, were it not that its scientific name, given above, stands all over the world. This splendid hawk is of a dark brown plumage above, mixed with soiled white and stone gray. On the under parts, posteriorly, it is grayish or pure white, tinged with buffy as we pass up either side of the breast. Abdominally, it is streaked with a rich brown, approaching blackish. The bill and irides of the

OFTEN WE FIND THE YELLOW LADY-SLIPPER GROWING IN LITTLE GROUPS (*C. pubescens*).

Fig. 8—Five perfect plants of the Larger Yellow Lady-slipper (*C. pubescens*), giving a very excellent idea of this species as a whole, apart from a view of the roots.



WE HAVE ALBINOES AMONG FLOWERS AS WELL AS AMONG ANIMALS

Fig. 10—This rare specimen was found near Hyattsville, Maryland, by Miss Boone, of the U. S. National Museum; it is *C. acaule* bearing an albino flower.

eyes in the adult are brown—the former more of a horn-color. In the immature specimen the bill and eyes are yellow. Legs and feet in all specimens are of a rich yellow. This is one of our largest hawks, often spreading to nearly sixty inches, though three or four inches short of that is the general rule; an adult female will measure some twenty-two inches in length.

Red-tails build big, bulky nests of twigs and bark, with some moss, high up from the ground in large trees. The same structure is used year after year, becoming more and more bulky as additional material is annually added to it. The three or four eggs vary widely in size, form, and color pattern. An average one may be whitish, blotched with reddish and brown, while others are nearly white, without any markings to speak of; and some are seen where the markings form a wreath encircling the larger end or butt. There are several subspecies of this famous hawk occurring in different parts of the country, as Krider's Hawk; the Western Red-tail; Harlan's Hawk, and the Alaska Red-tail. All have their subspecific scientific names, and have long been known to ornithologists. Then, too, all of the different forms have been called *the* "Hen Hawk" by laymen all over North America. On rare occasions they do eat poultry; and for this comparatively slight offense, thousands upon thousands of them have paid the death penalty at the hands of the farmer and uninformed countryman. At least sixty-six per cent of their food consists of small mammals that are the greatest enemies the farmer has to defend himself from, while hardly seven per cent of this valuable bird's food consists of poultry. The latter has been proven to be either old, useless fowls, or perchance so diseased as to be a good riddance to the farm-yard anyway. In this manner our Red-tail Hawk performs a service by keeping down fatal fowl epidemics, or destroying those domestic fowls that have been crippled by frost-bite, old age, and accidents. Its chief food consists of various species of ground and arboreal squirrels; all species of field-mice, rats, gophers, rabbits, moles, and a score of others that are the chief enemies of the agriculturists and country residents generally. In fact, this hawk should receive Federal protection against those who aim to destroy it, and a stiff fine should be imposed upon any unauthorized person killing one impressed with the idea that the bird is a pest and one of the poultryman's enemies. One of the great mistakes constantly being made by such thoughtless people is to destroy any bird that may prey upon a few fowls each year, notwithstanding the fact that it does destroy ten times the nummer of rapidly breeding vermin.

OUR FARMERS HAVE A GREAT FRIEND IN THE RED-TAILED HAWK (*Buteo b. borealis*);

Fig. 11—Our Red-tail Hawk is an elegent species; this is a subadult specimen taken in northern Virginia. This Hawk is a great destroyer of rats and field mice as well as other vermin.

SPLENDID PROGRESS OF WOODEN SHIP BUILDING

ACCORDING to the United States Shipping Board, one ship a day is the pace wood ship yards now are setting for other shipbuilding plants.

The first seventeen days of May witnessed the launching of many wooden ships, adding 60,000 tons to the American merchant marine. In four successive weeks, the production of wooden ships has exceeded a launching a day.

Just recently the shipping board received word by telegraph of four launchings in a single day. That was the banner day in war-time shipbuilding, a total of 14,500 tons going into the water.

The ships launched on the record-breaking day were:

Pascagoula, 3,500 tons, Dierks, Blodgett Company, Pascagoula, Mississippi; Kuwa, 3,500 tons, Grant Smith-Porter Ship Company, St. Johns, Oregon; Blackford, 4,000 tons, Grays Harbor Motor Ship Company, Aberdeen, Washington; Basco, 3,500 tons, Universal Shipbuilding Company, Houston, Texas.

FOREST RESEARCH AND THE WAR

BY EARLE H. CLAPP

ASSISTANT FORESTER, UNITED STATES FOREST SERVICE

IF justification were ever needed for forest research work, the war has amply provided it. Lacking the peaceful gains made by the Department of Agriculture it would not have been possible to increase our food production, our meat supply, our forage resources, and to bring about a more effective use of wood and forest products in the degree in which this has been accomplished in the last few months. There is rarely time during a national crisis to develop a scientific basis for intensive practical application in the field of forestry, and the past work of the Forest Service is making it increasingly possible to aid those of our allies without such a basis and with problems in forest products.

Under the stress of national necessity fundamental scientific principles find application in a thousand ingenious ways, methods are enormously expanded and developed, and the investigative work itself is concentrated on the more pressing problems. This is exactly what is now happening in forest research. Before we entered the war the research work of the Forest Service was too little known outside the profession of forestry and a few wood-using industries. The Forest Products Laboratory carried on its investigations with too little recognition from scientific and technical men in general. Today there are few branches of the Government employing wood which do not utilize the results of Forest Service research. These results, however, would not now be so fully utilized had it not been for the zeal and public spirit of the research organization in systematically bringing them to the attention of every interested agency.

It would take too long, and it is not the time to enumerate, the strides made by our research, or to tell of the place which it occupies in the prosecution of the war. A few facts will suffice to show how useful the results are proving to the country. The Forest Products Laboratory's studies in the properties and uses of woods have practically laid the foundations for all existing Governmental specifications for wood. This is particularly true in the case of aircraft construction, shipbuilding, military vehicle and box manufacture. The demand for large supplies of Sitka spruce brought up prominently the question of rapid kiln drying without lessening the strength and toughness of the material. What the Laboratory has accomplished in its studies of kiln drying has proved an invaluable asset in this field, and hundreds of new dry kilns have been established throughout the country after the pattern evolved at the Laboratory and through its direct initiative, and there is besides a wide-spread improvement in commercial drying practice.

The large demand for woods of special qualities necessitated the seeking of substitutes for woods previously used or finding new kinds of wood for new uses brought about by modern methods of warfare. The products of wood distillation have been brought greatly into prominence, and here again the research of past years has proved of great value. The possibility of obtaining ethyl alcohol from wood waste promises to be an important measure of national economy. Also of immediate military or commercial value are problems relating to gas warfare, offensive and defensive, extraction of potash from wood ashes, pulp-wood containers as substitutes for glass and tin, substitutes for raffia in camouflage, and impregnation and other treatment of temporary nose plugs for shells, and the like. The staff of the Madison Laboratory is now practically double that employed at the beginning of the war.

It is only because much of the fundamental knowledge was already secured that it has been possible to develop the work to its present state. The same is true of the results of silvical investigations. In finding substitutes for woods of which there is an inadequate supply, our knowledge of the different trees and their distribution has proved of great help. Past studies of the woodlot problem and the methods of handling woodlot timber form the necessary foundation for the present wood fuel campaign. The increased production and use of wood for fuel is at the same time the best means of improving the farmer's woodlot. Without the knowledge of how to handle woodlots the drain upon them might have proved calamitous.

The war, too, is going to leave a marked influence on the character of our research. Under the stress of a national crisis it has become more clear that there is a close interdependence between the different lines of forest research. A wood can be used with the greatest efficiency only when all of its qualities, mechanical, physical, and silvical are known.

For the first time in the history of forestry, scientists much more generally have come to feel that, in the members of the Forest Service engaged in research, the Nation has a body of men as fully equipped as those in the older scientific lines, and that the technical results secured are on the same high plane as those secured in other sciences. Forestry as an independent and generally recognized science has now become an accomplished fact.

CONSERVATIVE CUTTING FURNISHES FUEL FOR TOWN

THE White Mountain Forest has furnished practically the entire winter's supply of fuel to the people of Bartlett, N. H. Sixty-two families bought a total of 565 cords of wood at the price of $1 per cord for stumpage. Cutting, which was done under the supervision of the Forest Service, was carried out in such a way as to improve the condition of the forest. Practically all of this wood was cut by the individual purchasers in their spare time, so that the total cost to the consumer, including stumpage and hauling, was but $2.50 per cord.

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FEDERAL HORTICULTURAL BOARD URGED TO EXERCISE DECISIVE POWERS

SHALL there be a quarantine against the importation into the United States of plants with earth about their roots? This question was brought officially before the Federal Horticultural Board at a recent hearing and the reply will mean much to the agriculture, horticulture and forestry of the country. The public hearing was held before the Board on May 28, 1918, to determine whether all plants with earth about the roots, together with certain groups of plants from the Orient and other little explored countries, be excluded from entry into the United States. The proposals sent out in advance by the Federal Horticultural Board as a basis for discussion at the hearing follow:

Provisional Recommendations of the Bureau of Plant Industry.

A. That all foreign grown balled, tubbed, or potted plants, except as noted under B, be excluded in accordance with the following groups and dates:
Group 1.—Azaleas, Rhododendrons, Palms, Araucarias, Bay Trees, Hollies, Ericas, and Acacias, January 1, 1923.
Group 2.—Conifers, dwarf and other kinds, Buxus, etc., usually shipped as specimen plants, July 1, 1919.
Group 3.—Small potted plants, including Roses, chrysanthemums, Violets, tender bedding plants, Ferns, tropical and sub-tropical, plants, etc., January 1, 1919.
Group 4.—Clumps of hardy perennials used in forcing, Japanese Maples, Magnolias, etc., July 1, 1919.

B. That provision be made for the admission of limited numbers of new varieties or novelties out of pots not exceeding two inches in diameter, this work to be conducted through the Department under rules and regulations prescribed by the Federal Horticultural Board.

C. That no action be taken at this time toward the exclusion of *all* stock from the Orient, and other little explored parts of the world, but that steps be taken looking toward action in the near future of excluding certain groups of plants, especially from the Orient.

The hearing was well attended by representatives of the nurserymen and importers, and also by state foresters and national and state inspectors of nursery stock, and other state and national officials. Officers of many States who could not appear in person had written their views on the matter to the Board and in other cases Congressmen appeared for their States. The opposition of the importers to these proposals was not very strenuous. They dwelt upon the desirability of being permitted to continue the importation of certain fruit stocks, especially apple and two or three other plants, like palms and manetti rose stocks. Whether this failure on the part of the nurserymen and importers to vigorously oppose these proposals of the Board was due to a conviction of the need for drastic quarantines or to the general sentiment throughout the country in favor of such action was not determined. On the other hand, the entomologists, pathologists, foresters, horticulturists and other scientists representing their respective States, presented a great amount of evidence in support of the measure.

The quarantines as proposed by the Board were unanimously approved by the representatives of the peoples' interests. Many of the delegates had been appointed by the Governors of their respective States to attend the hearing and conference.

Practically all of the delegates to the hearing representing States signed the following recommendations:

> It is agreed to approve "The Provisional Recommendations of the Bureau of Plant Industry" as reported by circular letter May 8, 1918, except in the case of Group I, including Azaleas, Rhododendrons, Palms, Araucarias, Bay Trees, Hollies, Ericas and Acacias, that the exclusion date of this group be not later than the exclusion date of Groups II and IV, which is July 1, 1919.
>
> At this meeting the opinion prevailed unanimously that immediate exclusion of plants from the Orient and other little explored parts of the world—except the Japanese lily bulbs, and sacred lily bulbs from Amoy, China—be urged at this time.
>
> It was further agreed to urge the exclusion of all ornamental and forest nursery stock, not heretofore mentioned on and after July 1, 1919, and that fruit stocks also be excluded as soon as economically practicable.
>
> It is understood that for the purpose of securing new varieties the Department of Agriculture should bring in for propagation purposes such plants under such rules and regulations as it may devise.

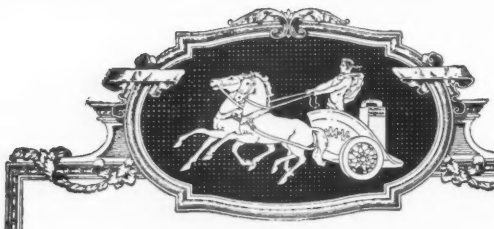
It was shown conclusively, and no attempt was made to rebut the arguments that the Federal and State inspectors of nursery stock, were powerless to properly inspect stock with earth about the roots because the insects and fungi could not be detected in the earth, and no means of fumigation had been found. The danger of bringing in plants from the Orient and other countries which had been little explored for dangerous insects and fungi, came from the fact that new and dangerous pests unknown here could easily escape the detection of inspectors because they did not know what to expect or how to guard against such pests.

The point was made with little opposition that the only way the interests of the farmers, fruit growers, and woodland owners of the country could be safeguarded against these imported pests was to prohibit the importation of all nursery stock. While some pests can be expected to reach here in unusual ways the great danger comes from the importation of their natural carriers.

The decision of the Federal Horticultural Board will be awaited with general interest.

TWO large mining and concentrating companies have made small-scale tests on hardwood tar as a flotation oil and both of these have reported very satisfactory results

THE American Forestry Association is preparing a service flag for those of its members who are in the Army or Navy. Names of such members, with military designation, should be sent to this office promptly.—Ed.



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FORESTRY AS A WHOLE

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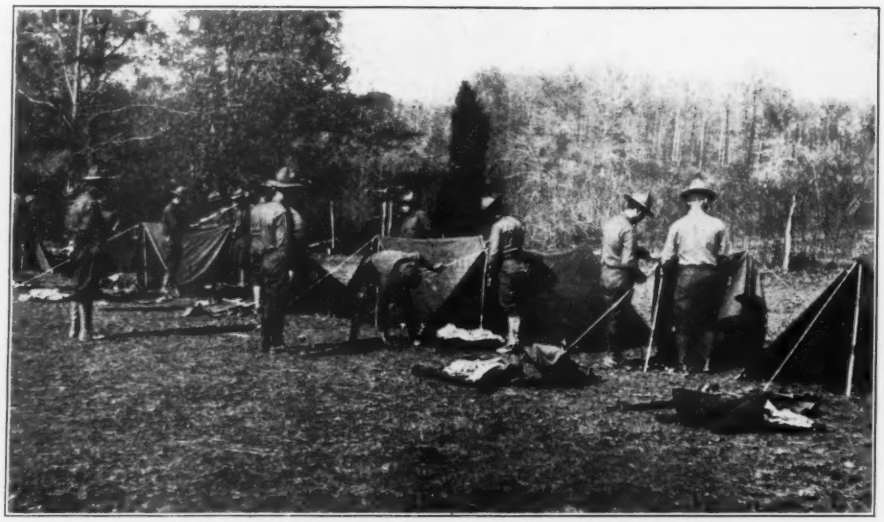

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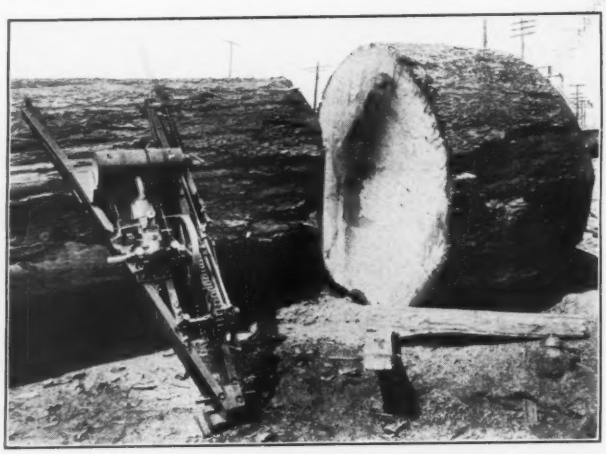

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Washington, D.C.

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